

CORPORATE STRATEGY, ORGANIZATIONAL STRUCTURE AND CONTROL, AND ECONOMIC PERFORMANCE

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by
SANJAY SAHA

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INDIAN INSTITUTE OF TECHNOLOGY, KANPUR**

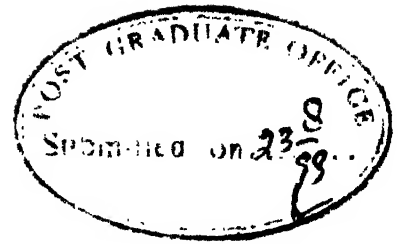
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TO
MY BELOVED PARENTS
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SWAMI SUPERNANANDA

SYNOPSIS

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The present study was designed to examine the influence of business policy on corporate performance. As a result, the emphasis was on the firm level variables which affect its performance. In general, such firm level variables influence performance through (a) the managerial decisions which translate market potential into sales revenue, and (b) the costs of production resulting from specific organizational mechanisms. Such an analysis was thought to be useful in providing guidelines for making the corporate sector more efficient in the process of implementing the liberalization policy which is put into effect recently.

Data relating to a cross-section of firms (averaged over five years to eliminate the purely short run market fluctuations) in specific industries was considered the most appropriate data base for

such a study. Four major industries, viz., chemicals, cotton textiles, electrical cables and goods, and general engineering were taken up for the analysis. The data pertains to the most recent five years between 1986-1992 in most cases and was obtained from the Bombay Stock Exchange Official Directory.

The organizational economics literature is the natural source of alternative hypotheses in such a context. For, these studies often emphasize the extent to which specific organizational structures can (a) optimize the informational flows between the different echelons of the firm, and (b) reduce the control loss intrinsic to decentralized decision making within the firm. In general, only the performance equation is considered and the reduced form approach is utilized to test the various hypotheses. This methodology is similar to the industrial organization literature where the firm specific variables are considered to have an independent and additive effect on its performance.

In this study, the following types of variables were included in the model specification. (a) The environmental variables which reflect the market conditions external to the firm, (b) the corporate strategy variables with respect to the products and markets, (c) the organizational structure variables with an emphasis on the M-form characteristics, (d) the ex post realization of the ex ante incentive and control variables implicit in the operation of the M-form structure, and (e) the variables representing the decisions concerning the generation and utilization of capital and other assets of the firm. Three basic measures of performance were chosen : (a) SHPT (the net profits as a percentage of net sales), (b) LOPA (the net profits

as a percentage of net assets, and (c) LOPT (the net profits as a percentage of networth).

The reduced form model suggested by the organizational economics approach was tested at the outset. The success associated with the adaptation to the external market conditions and the effectiveness of the control exercised by the CEO towards the profit maximization objective were the central determining features of the long run profit position of the M-form firm and its realization in the short run. Conversely, it was noted that the inability to effect cost control and/or adapt operational decisions of the organization to the purely unexpected short run market fluctuations makes the M-form vulnerable. However, the variables representing the organizational structure per se did not show the expected influence which the M-form literature attributes to them. There was also an indication that the institutional arrangements to provide short term credit for working capital requirements were insufficient to stabilize performance when confronted with short term market fluctuations.

In general, it is not possible to argue that an organizational structure automatically results in the requisite controls and managerial motivations. Instead, the control systems are probably best considered as a combination, involving elements of both the structure and the process of control. The additive specification is inadequate to reflect this satisfactorily. One alternative is to introduce the interaction of the organizational structure with control and the actual decisions made.

Two observations emerged from the empirical results of the interaction model. (a) There was a persistent institutional problem

with respect to the financing of the short term working capital. It would be worthwhile for the banking sector authorities to review this appropriately. (b) The efficacy of an organizational structure depends upon the existence of the appropriate controls and monitoring. In particular, it was observed that appropriate controls were essential to ensure efficient performance even in those firms for which the organizational structures were chosen to fit their corporate strategy. The control loss problems of decentralization therefore should not be underestimated.

More fundamentally, there can be multiple directions of causation which cannot be satisfactorily captured by the reduced form or the interaction models. Hence, it would not be sufficient to explain the performance alone using single equation models. Instead the performance equation is probably one equation in a system of equations in which performance, internal structure, size and growth are jointly determined. The business policy model of the Harvard business school provides a framework through which the motivations and behavioral patterns underlying the complex interactions of the various aspects of the business policy can be exhibited. Empirical experiences with such a model suggested the following properties regarding the business policy of the corporate sector : (a) the diversification strategy was mostly along product market lines and was motivated primarily by the need to cushion market uncertainty. This requires a proper ex post control of the organizational decisions. (b) There was some evidence to suggest that the problems at the divisional level increased costs and reduced the control of the general manager. (c) The balance between the individual effort on the one hand and team work on the

other explained the success of the M-form. Stable market environment, which made the cost control aspect crucial, might have been most conducive to the success of the M-form structure.

As far back as Porter (1981) there was optimism that both the industrial organization studies and investigations of business policy are converging and that there is a chance of each of these enriching the other. However, the progress over the past decade has been rather fragmentary. In general, there is a need to strengthen the behavioral basis of the business policy approach. It can only be claimed that this study is a first attempt, albeit an important one, to understand the influence of business policy on corporate performance.

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Needless to say, I alone am responsible for any remaining errors.

Sanjay Saha;
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CHAPTER 1

INTRODUCTION

1.1 INDUSTRIAL ORGANIZATION

Conventional studies of industrial organization maintain that the observed variations in the price-cost margins of firms across industries can be primarily explained by the market (or industry) structure. Such studies generally define the market structure in terms of the demand for products, market concentration, and entry barriers. As Kay (1991, p.58) put it, this emphasis on market structure was perhaps a result of the preoccupation with the antitrust legislation and other public policies to mitigate monopoly power in certain markets.

However, in practical terms, even such public policies and the resulting legal action could be directed only towards certain firms within specific industries. As a result it was necessary to examine the extent to which the firm level decisions, in addition to (or as opposed to) the market structure itself can affect the performance of the firms. Hence, in general, the industrial organization literature also acknowledges the extent to which the firm can influence its market share by utilizing its distinctive competencies¹, strategies regarding its product range, advertising and R and D, and the life-cycle effects. See, for instance, Grabowski and Mueller (1978, p.331). It has also been acknowledged that certain firm level

1. According to Hitt and Ireland (1986, p.402) a "distinctive competence is a firm's ability to complete an action in a manner superior to that of its competitors or to apply a skill that competitor's lack." Such distinctive competencies can be found in functional areas, e.g., personnel, production, marketing, finance and so on.

decisions can also have an effect on the cost structure of the firm. Hence, this aspect can also have implications for the observed price-cost margins of firms. Even when this is acknowledged, the industrial organization literature takes the position that the reduction in cost has an effect on the monopoly power of a firm only through the change in the output produced by the firm and the consequent change in the elasticity of demand which it entails. Similarly, in much of the recent literature, conduct is narrowly defined in terms of the firm level decisions like the output-inventory levels, advertising, and R and D expenditure. See, for instance, Gupta (1983), Langlois (1989) and the references cited therein. Fairly detailed reviews and critical appraisals of both the theoretical and empirical results can be found in Jacquemin and DeJong (1977), Bresnahan (1989), and Schmalensee (1989).

The analytical content of the structure-conduct-performance paradigm can be exhibited in the following manner. Let the demand curve for the firm be given by

p = price per unit of output = $p(Y)$, and

c = total cost of production = $c(Y)$

where Y = volume of output produced.

Then, the profit (π) maximizing firm would choose a price

$$p = c_1 / \left(1 - \frac{1}{\eta}\right)$$

where c_1 = marginal cost, and η = elasticity of demand. The Lerner measure of monopoly power is given by

$$L = (p - c_1) / p = 1 / \eta$$

which is independent of the marginal cost of production². Suppose, on 2. Let the management exhibit discretionary managerial behavior and maximize a preference function $u(\pi, Y)$. It can then be shown that L depends on c_1 . However, this argument will not be pursued any further.

the other hand, that cost of production can be reduced by specific management strategies. In such a case the profit maximizing choice of Y increases even with a given demand curve. This results in a reduction in η and an increase in L if the demand curve is downward sloping (but does not necessarily have a constant η) for all values of Y . The large size of the firm and/or its lower cost of production may become a barrier to entry. This may enable the firm to sell a larger output at a given price. That is, there must be a shift in the demand curve in addition to the movement along it. Let the demand curve be

$$p = p(Y, S)$$

where S is an organization specific variable. If this results in a reduction in η at the profit maximizing level of output there will be an increase^a in L . In essence, these studies maintain that the only channel through which monopoly power can be affected is through the changes in the elasticity of demand.

1.2 ORGANIZATIONAL ECONOMICS

Another direction of research has its origins in organizational economics. The primary emphasis of this literature has been the extent to which specific organizational structures can (a) optimize the informational flows between the different echelons of the firm, and (b) reduce the control loss intrinsic to decentralized decision making within the firm. The most influential hypothesis is that "(t)he organization and operation of the large enterprise along the

a. Williamson (1986, p.250 ff), Wiggins (1991, p.633 ff) and others argued that such changes should not be subject to antitrust regulation. For, they represent capitalism's creative response to environmental opportunities.

lines of the M-form firm favours goal pursuit and least cost behavior more nearly associated with the neoclassical profit maximization hypothesis than does the U-form organizational alternative." - Williamson (1970,p.134). Extensive empirical tests of the influence of the organizational structure on the performance of firms can be found in Armour and Teece (1978), Teece (1981), Hill (1984, 1988), Cable (1988), Hamilton and Shergill (1992) and other references cited therein. In the final analysis it was found that several managerial decisions, in addition to the organizational structure, must be taken into account while explaining organizational performance. Porter (1981,p.610) was optimistic that "exposure to business policy concepts is having a decidedly positive influence on industrial organization research...."

As evident from the comprehensive survey by Cable (1988), these studies emphasize (a) the extent to which the management can translate market potential into reality by appropriate decentralization and control, and (b) the resulting reduction in the costs of production which contribute to the profitability of the firm. Fig.1.1 illustrates the basic argument. Let AC_u and AC_m be the average cost curves before and after organizational changes, respectively⁴. Assume that E_u and E_m are the corresponding profit maximizing levels of

4. When the firm size and its production level are small the information requirements are not very large. In such a case the U-form organization may be efficient enough for information processing and the control advantage keeps AC_u low. On the other hand, the control loss of the M-form organization makes the $AC_m > AC_u$. Beyond a size S_1 , however, the information loss of the U-form may be far more than the control loss of the M-form so that $AC_m < AC_u$. It is conceivable that when the size exceeds S_2 the M-form becomes inefficient purely due to the opportunism at the divisional level and significant control loss. See, for instance, Wintrobe and Breton (1986,pp.532 ff) and Kinnie (1987). That is, AC_m would exceed AC_u once again. A similar diagram was used earlier in Rao (1989,p.56) in a related context.

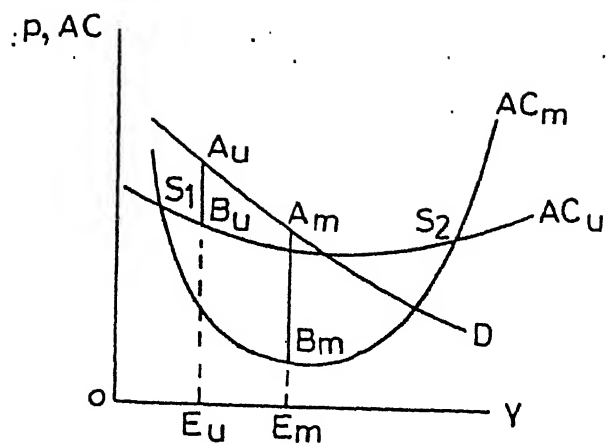


FIG 1.1

Firm Equilibrium under varying Organizational Structures

output. It follows that the difference between price and average cost, viz., $A_u B_u$ and $A_m B_m$ are due to the changes in the organizational factors as well as the elasticity of demand⁵. In general, there is no conclusive evidence to suggest that the organizational variables influence the profit position of the firm only through the changes in the elasticity of demand. See, for instance, Clarke et al (1984). As such it appears that the effects of the elasticity of demand and cost structure on the profits of the firm are distinct. In either case, organizational changes can in general increase profits per unit of sales as well as the overall profits. Consequently studies of between firm differences within an industry, which concentrate on the organizational variables alone, are more important from a business policy viewpoint⁶ rather than the antitrust emphasis of industrial organization.

There are at least four situations in which the emphasis on costs is important from the business policy perspective. (a) In periods of stagnant market demand cost reduction is the only effective mechanism available to the firm. (b) Organizational change constitutes an important competition policy even in periods of buoyant demand. (c) The inadequacy of external market control due to the separation of ownership and control alluded to by Berle and Means (1932) can also lead to the necessity to emphasize the internal control apparatus of

5. This does not contradict the position that the monopoly power can be altered only through the change in η resulting from the organizational innovation.

6. The neoclassical theory of the firm usually neglects this aspect by postulating that the profit maximization requirement motivates the management to adopt efficient organizational choices. However, there is enough evidence to suggest that, in the context of firms operating in an oligopoly market, the persistence of managerial discretion does not ensure this. See, for instance, Cable (1988) and Hill (1988).

the firm. See, for instance, Williamson (1971,p.371). (d) As noted in Williamson (1970, 1971) there is a need to reduce the information overload and information impactedness in large and complex organizations.

This approach supplements the industrial organization studies in practice. For, in empirical practice both types of studies measure the price-cost margins by

$$M = (p - AC) / p$$

where AC = average cost of production. Hence, at the profit maximizing level of output

$$M = 1 - \frac{c}{c_1 y} \left(1 - \frac{1}{\eta} \right)$$

which depends both on the elasticity of demand and the cost structure. See, in particular, Clarke et al (1984).

Taking the lead from the industrial organization literature the work on organizational economics also considers the firm specific variables to have an independent and additive effect on its performance. As Bresnahan (1989) and Schmalensee (1989) put it, both these types of studies adopt the reduced form approach.

However, following Williamson and Bhargava (1972), and Williamson (1986 , p.179) it has been recognized that the efficiency of the decentralized organizational structures depends upon a combination of structural and control properties⁷. The additive specification is inadequate to reflect this satisfactorily. For instance, suppose the management estimates that a certain product strategy when implemented through a divisionalized organizational structure results in

7. It is not clear from the classification schemes adopted in the literature so far that there is a satisfactory method of combining the structural and control dimensions. We will return to this in the next section.

$$PE = a + b SO; b > 0$$

where PE is a measure of performance, and SO is an organizational structure variable. However, the lack of appropriate control may reduce the firm's performance below this level. An alternative to the additive specification is to write

$$PE = \alpha + \beta (a+b SO) IC.$$

with the sign of β determined by the nature of the control variable represented by IC. Varadarajan and Ramanujam (1990,p.475) offered the most convincing explanation. As they put it, "(p)ursuing a philosophy of decentralization may be a necessary response to the relatively high level of product line breadth and geographic diversification in many of the firms. The concomitant use of tight financial controls and reporting systems appear to be indicative of a conscious effort by these firms to manage the structural complexity entailed by a strategy of product and market diversification." Also see Teece (1981,p.174,footnote 5) and Otley (1988,p.87)⁸.

A similar problem was encountered by the contingency theorists who emphasize strategy-structure fit as a major determinant of corporate performance. Fit and misfit, as evident from the analysis of Donaldson (1987) and Hamilton and Shergill (1992), are postulated as a priori norms. A judgement similar to that of Williamson and Bhargava (1972) with respect to the organizational structure is therefore involved. On the other hand, Hill (1988,p.71) suggested that a specification involving the interaction of the strategy and structure variables would be preferable. Also see Steer and Cable (1978,pp.17 ff). As it turns out, this is only a half-way house

⁸. Details of the specification will be taken up in chapter 3.

towards a more practical approach to the performance appraisal of the firm.

1.3 BUSINESS POLICY

The business policy literature, following the classic work of Learned et al (1969,pp.178 ff), takes the view that the market structure can only define the potential for profit and that the essence of management is to translate it into reality. More often than not efficient firms derive their advantages from cost minimization rather than the enhancement of monopoly power. See, for instance, Hill and Pickering (1986) and Wiggins (1991). Further, there has been a pervasive feeling that decisions with respect to the organizational structure constitute only one of the aspects which account for the realized profits. For, it is well-known that (a) the U-form has informational disadvantages while the control is efficient, whereas (b) the M-form loses on the control aspect while gaining an advantage with respect to the information impactedness dimension. See, for instance, Williamson (1971), Mueller (1972), Caves (1980,p.66), Marginson (1985,p.39), Wintrobe and Breton (1986,pp.532 ff), and Cable (1988,pp.15 ff). That is, the net cost advantage, if any, depends on the control dimension and the resulting decisions of the management. This has led to the observation that "until organization-economic concepts are more fully developed in explaining (the behavior within firms) they will be of less utility in organization theory (and business policy) than was anticipated." - Barney (1986,p.141, emphasis added). In particular, as Mueller (1992, p.148) put it, "(t)o understand the corporation, and the important role it plays in the economy, we need to build our analysis on a

richer behavioral foundation."

The significance of the business policy oriented literature is its emphasis on the firm level organizational structures, controls, and managerial decisions as the more important considerations in realizing potential profits for the firm. Apart from this change of emphasis it has come to be realized that the cost reducing aspects of business policy have a fundamental bearing on the orientation of public policy as well. See, for instance, Williamson (1986, pp.254 ff) and Wiggins (1991). From this analysis it can be concluded that a more detailed business policy model should be set up to examine the determinants of corporate performance. Such an analysis may enable us to evaluate the position of Naylor and Thomas (1983, p.127) that "(s)trategic planning may well be the single most important application of the microeconomic theory of the firm... to practical business problems." Even from a more practical standpoint, as Mahoney (1992, p.67) pointed out, "theoretical pluralism increases empirical content and should be valued by those concerned with progress in the emerging field of strategic management."

It is by now reasonably clear that the following aspects should be examined in such a context : (a) the perception of the management about their market environment (EN) and the extent to which their distinctive competencies and strategies can modify it, (b) the product and market strategies (ST) which they adopt, (c) the organizational structure chosen to put their strategy into operation (SO), (d) the control apparatus and incentive mechanisms (IC), and (e) the actual product range, marketing, and capital structure decisions of the firm.

1.4 DATA BASES

The appropriate data base can be determined given the objectives of the study. In general, the possible sources of data can be classified as in Table 1.1. Clearly, data types (1)-(4) have been considered appropriate whenever the emphasis is on the structure-conduct-performance paradigm. On the other hand, in the context of the studies of organizational economics data bases (5)-(7)

Table 1.1 Data Base Classification

Data Base	Cross-Section	Timeseries
Many industries	(1)	(2)
Many industries, Many firms	(3)	(4)
One industry, Many firms	(5)	(6)
One industry, One firm	na	(7)

Note : na - not applicable

are far more useful. The present study utilizes a data base of type (5)⁹.

1.5 NATURE OF THE PRESENT STUDY

The primary emphasis of the present study is on the organizational dimension. Such an analysis provides guidelines for making the corporate sector more competitive in the aftermath of the liberalization policy which is currently put into effect. The influence of the firm level variables, especially those related to the

⁹. It would have been possible to pool the available data for several firms in each of the different industries to obtain a type (3) data base. However, as Grabowski and Mueller (1978,p.331) pointed out, it is necessary to cover a wide cross-section of manufacturing industries and have data for many firms in each of the industries to avoid systematic biases. Such an extensive data was not available for the organizational variables. Further, it was felt that the high degree of heterogeneity across industries exhibited by the available data would make such a study unreliable.

cost of production, have therefore been incorporated into the analysis. All the three versions of the models, viz., (a) the reduced form model, (b) the model with interactive effects, and (c) the business policy model have been estimated.

The rest of the study is organized as follows. Chapter 2 presents a detailed review of the literature with an emphasis on the essential aspects of specification of these models. Chapter 3 describes the choice and measurement of the variables. Chapter 4 describes in detail the empirical experiences with the first two models. Chapter 5 elaborates the business policy model and its empirical validation. Chapter 6 provides a summary of the main conclusions and outlines several extensions for future research efforts in this direction.

CHAPTER 2

REVIEW OF THE LITERATURE

2.1 INTRODUCTION

The microeconomic theory of the firm was historically no more than the theory of the markets-Jensen and Meckling (1976,p.306).It was generally postulated that each of the firms in the market (or at least the representative firm) was affected in exactly the same way by the decisions of all other firms in the market. Similarly, it was generally postulated that the firms react to the external constraints in a similar fashion. In the neoclassical theory of the firm the interrelationships between the firms in a given market are characterized through the variability of the demand curves. The cost curves of the firms are taken to be independent of the decisions of the other firms in the market. This approach to the theory of the firm resulted in the conclusion that the market structure determines the conduct of the firm and this in turn determines its performance.

The industrial organization literature has been the empirical counterpart of this theory of the firm. The economic performance of the representative firm in a market was postulated to depend upon the market structure. The empirical assumption is that the firm, given its goals regarding its performance and the external market conditions, adapts its conduct optimally, including the choice of the organizational structure and control mechanisms. This approach is usually designated as the structuralist paradigm. See, for instance, Martin (1989, Ch.7), Scherer (1980, Ch.17), and Schmalensee (1989).

In practice, it was acknowledged that the specification of the market structure must be multidimensional. The following aspects have

been taken into account at one time or the other: (a) the number of sellers in the market, (b) the degree of product differentiation, (c) the cost structure, (d) the degree of vertical integration with the suppliers, (e) the height of barriers to entry and exit, and (f) the extent and character of international competition. Caves (1980, pp. 64-92) provides a succinct summary of these aspects. Similarly, the choices available to the firm (or conduct) can be described in terms of (a) output decisions, (b) pricing (whenever discriminatory practices are possible), and (c) advertising and marketing expenses, investments in R and D and so on. These dimensions of conduct have been examined in Tirole (1989, Ch. 1). The performance was measured only in terms of the price-cost margins and degree of monopoly power. However, it should be noted that conduct may, in its turn, affect certain dimensions of the market structure.

In contrast, the 'behavioral' approach maintains that each of the firms in a given industry adopts different policies to develop and maintain monopoly power. The actual details regarding their conduct depends upon their specific objectives at a point in time and changes in them over time. Clearly, the performance of the firm depends on these strategies in addition to the market structure. It can also be suggested that the conduct of the firms may also change the market structure over time. More generally, the main hypothesis of the behavioral approach is that the one way causation indicated by the structure-conduct-performance paradigm is untenable. A broad description of the behavioral alternative can be found in Jacquemin and DeJong (1977, Ch. 6).

The behavioral approach has been developed along several

dimensions. Firstly, it has been noted that monopoly power can be generated and maintained over time if there is an uniqueness in what the firm has to offer in a given industry. The specificity may be with respect to (a) fixed assets and technology, (b) product range, (c) specific skills of workers and managers, (d) unique marketing channels, and so on. That is, corporate decisions with respect to the products and marketing management constitute one of the strategic choices of the firm. Secondly, the specificity of assets makes it difficult for the firms to utilize a market mechanism for conducting its transactions. In particular, the firm experiences market related transaction costs as noted by Coase (1937) and Williamson (1970). In addition, the firm may not be in a position to maintain the specificity or business secrets if the transactions are conducted on the market. Internal organizational structures may replace market transactions so long as the agency costs alluded to by Jensen and Meckling (1976) are favourable. Conversely, organizational abilities acquired over time may alter corporate strategies as well. The emergence of different organizational structures and their implications for organizational performance is one of the aspects of the behavioral paradigm. Thirdly, the internalization of decision making creates an information overload at various levels of management. This gives rise to opportunistic behavior and moral hazard at various organizational echelons. This may manifest itself in the form of diluting profit maximization goals. Instead, as Williamson (1964,1970) and others have noted, corporate management tends to expand those classes of expenditure for which it has a positive preference (such as large salaries, expense accounts,

bonuses, retirement pensions, and stock options at the shareholder's expense) beyond the level acceptable to a strict profit maximization objective. Similarly, as Odagiri (1981,Ch.1) Cable and Yasuki (1985), and Marris (1971) noted, the management may give preference to the growth of the firm at the expense of profit maximization. The management may also respond to moral hazard by creating suitable managerial controls as a part of the organizational structure. These controls, while they reduce resource diversions in the sense of Hoenack (1983,p.4), give rise to additional costs and reduce the maximum attainable profits. That is, profit maximization may no longer be possible. Fourthly, it was pointed out by Berle and Means (1932,Ch.6) that the large financial requirements can no longer be fulfilled by internal sources and/or market borrowings. Equity participation on a large scale had effects on the cost of obtaining finances as well as the control which the management has on organizational decisions.

In sum, the growing body of literature dealing with the behavioral approach suggests that the firm is a complex organization made up of a coalition of agents pursuing various goals, and coordinating and controlling economic activities by non-market as well as market allocative mechanisms. See, for instance, Jacquemin and DeJong (1977, Ch.6). Basically the top managers' perception of the market structure and the firm's strengths and weaknesses jointly determine their choice of 'corporate strategy' and 'organizational structure' (i.e., the internal allocation of tasks, decision rules, and procedures for appraisal and reward, selected for the best pursuit of that strategy). Hence both corporate strategy and organizational

structure influence the economic performance of the firm and the market in which it sells.

The studies dealing with the industrial organization initiated as well as followed up these insights into the theory of the firm. In particular, attempts have been made to examine the effects of (a) corporate strategy, (b) organizational structure, and (c) corporate control on the performance of the firms. Similarly, the possibility of a modification of the profit motive and its influence on the conduct of firms is being investigated. For all practical purposes it can therefore be concluded that the industrial organization literature has by now acknowledged (a) the general economic environment outside the industry, (b) the market structure, and (c) the organizational strategy, structure and control mechanisms, as the factors influencing the functioning of the modern corporation. The empirical strength of each of these factors depends on the specific economic context and it cannot be claimed that comprehensive information is available as of now.

2.2 EMPIRICAL EXPERIENCES

There are a large number of studies dealing with the structural approach. Starting with the aggregate industry level analysis of Bain (1951,1956) considerable progress has been made in setting up detailed data bases at the industry level as well as the firm level. Early surveys of the literature can be found in Weiss (1974) and Gilbert (1984). More recently, Schmalensee (1988,1989) provided a rather detailed account of the hypotheses, the data, and the observed empirical regularities.

In contrast, the behavioral approach has not been so thoroughly

examined. However, there is a significant amount of literature documenting the effects on the performance of the firm of (a) business level strategy, (b) managerial preferences, (c) organizational structure, and (d) corporate control (as reflected in the financial choices). Fairly detailed surveys of the various empirical results can be found in Cable (1988), Hill and Pickering (1986), Bresnahan (1989), Jacquemin and DeJong (1977, Ch.6), Jensen and Ruback (1983), and Rao (1991).

It has been observed consistently that there are severe data limitations in most of these studies. In particular, the following aspects must be kept in perspective while interpreting the results :

- (a) Schmalensee (1988, pp.648 ff) noted that the accounting profits and stock prices, which are the most common measures of performance, are subject to conceptual as well as measurement problems. A detailed criticism was initiated by Fisher and McGowan (1983).
- (b) Schmalensee (1989) and others pointed out the difficulties associated with interpreting specific variables like the capital stock of the firms as measures of economies of scale, concentration, or barriers to entry. In general, there are strong correlations between the various measures of structure and conduct. Even a specification of the structuralist hypothesis in simultaneous equation models could not adequately resolve the ambiguities. See, for instance, Gupta (1983) and the references cited therein.
- (c) Bresnahan (1989) and others felt that a simultaneous determination of managerial objectives, along with a test of the structuralist hypotheses would be in order. However, the new empirical industrial organization (NEIO) literature is beset with problems of inference. See, for examples, Rao (1991).

With these general observations in perspective a few of the major results can now be highlighted.

2.2.1 THE STRUCTURALIST PARADIGM

The monopoly power of an industry, or any one firm within it, can be attributed to either the technology and cost of production and/or sales or the product specificity and the inelasticity of demand resulting from it. The existence of economies of scale over a wide range of output generally enables the firms in an industry to produce a large proportion of the total industry output. These economies may be technological and/or product related. It is generally noted that the size effects are important in explaining the recorded price-cost margins. More recently, it has been pointed out that the cost advantages may be specific to a particular product range. Economies of scope, reflected in the product strategy¹, has been shown to be an important determinant of the observed price-cost margins.

Market concentration, or its number equivalent in terms of the number of firms in the market, was also shown to have a significant effect on the price-cost margins². See, for instance, Cubbin (1988,p.52). Interpreted in fairly general terms, this ex post measure contains not only the influence of the potential economies of scale but also the effect of institutional and policy constraints on

1. Schmalensee (1988,p.670) interprets product choice differently. In particular, it was pointed out that (a) product differentiation enhances the market power of a firm by reducing the elasticity of demand, and (b) there are limits on the product range of a specific firm due to product specific fixed costs associated with design, tooling, advertising and so on.

2. According to Schmalensee (1989,p.976),"the relation between seller concentration and profitability is weak statistically, and the estimated concentration effect is small. This estimated relation is unstable over time and space and vanishes in many multivariate studies."

the firm.

The cost side can also be influenced by the monopoly power of the firm in its relation to the input suppliers. Both vertical integration and vertical contractual relations with input suppliers have been found to be important. However, in general, the measurement of these variables is severely limited and the empirical results have been equally unreliable.

Ex post monopoly power also depends on the barriers to entry which characterize specific industries. The standard variables which measure this have been the capital stock, the market share of the firms (or a four-firm concentration ratio), and the advertising intensity³. See, for instance, Comanor and Wilson (1967). Though most of these variables have been found to be significant in explaining the price-cost margins it is difficult to separate the scale effect from that of barriers to entry⁴.

In general, it was concluded that the market structure variables are important in explaining the observed market power and the price-cost margins. This does not however exclude the possibility that the behavioral paradigm is as important or even more so.

2.2.2 THE BEHAVIORAL APPROACH

Consider a firm in an oligopolistic market structure. Such a firm, due to its specificity of capital and other resources, has some

³. As Schmalensee (1988, p.673) noted, advertising intensity represents the ability of advertising outlays to differentiate products and create entry barriers. However, as Buxton et al (1984) remarked, the relationship is not monotonic.

⁴. In Rao (1989) it was suggested that they will represent the barriers to entry effect if they alter the demand curves of the firm. A direct test of this in the NEIO framework is not available. The reduced form price-cost margins specifications have not been able to make the distinction clear.

monopoly power initially. Conversely, it can also be argued that it generates such specificities to create monopoly advantages. In either case the rival firms in the market may not be in a position to counteract its strategy. They may also feel that the counter strategies are more costly in comparison to the expected benefits. In this sense the market loses control on the performance of the firm. Instead, the management and/or the owner of the firm acquire discretionary powers.

The origin of any corporate entity is the specificity with respect to various dimensions. However, product strategy and/or marketing strategy of the firm may necessitate changes in the organizational structure, changes in the financial mix, and/or a whole new managerial team. Secondly, when the external market control (or competition) is weakened it may be neither necessary nor desirable for the firm to maximize profits. Even tax policies and antitrust laws may inhibit such a behavior on the part of the firm. Consequently, the behavioral alternatives consist of several interrelated changes which together determine the performance of the firm.

The literature on these aspects, both in its theoretical and empirical dimensions, has been developed in a fragmentary way with significant overlaps and duplication. The same observed empirical regularity can be interpreted from different viewpoints with no clear methodological approach to distinguish between them. Three aspects are prominent in the literature : (a) corporate control, (b) discretionary managerial behavior, and (c) organizational structure and locus of control. There is no strict logical order in which they can be taken up. Hence, the above sequence will be followed to make

some useful distinctions.

2.2.2.1 CORPORATE CONTROL

Strictly speaking two questions are relevant here : (a) to what extent are the markets, or organizational mechanisms external to the firm, influence the decision making process of the firm? In this context the product markets, short run physical and financial markets for inputs, as well as the long run capital markets are relevant. Since the first two are usually subsumed under the market structure variables much of the literature on corporate control deals with the capital markets alone. (b) When the external control is absent or ineffective the owners of the firm and/or managers may define internal allocative mechanisms to coordinate the decision making process. The pertinent question would be the extent to which they add to the efficiency of the market mechanism. This question is important because the division of labor in large firms creates information asymmetry across different levels of management which in turn gives rise to moral hazard. That is, there are efficiency reducing possibilities of alternative organizational structures. The corporate control literature emphasizes only the organizational aspects pertinent to the capital structure even in this context. The other aspects are generally taken up in conjunction with corporate structure and information flows.

The corporate control literature can be divided into two strands of thought : ex ante and ex post . The distinction is basically between potential or likely deterrent control versus a realized expression of control in the form of a takeover or a merger. Naturally, this difference in emphasis has different implications for

corporate performance.

The ex ante approach, in its turn, defines the existence of corporate control in terms of three variables. (a) The percentage of common stock of the firm held by the managers. This is one strand of thought in the work of Berle and Means (1932) and emphasized by Jensen and Meckling (1976,p.305,footnote 1). Usually most of the studies reported about 10 percent as the lower limit. Even this order of shareholding appears to make a firm manager-controlled in contrast to owner-controlled. See, for instance, Jacquemin and DeJong (1977, p.135). (b) Since 90 percent of the common stock is held by outside shareholders there is a possibility of the emergence of a majority shareholder. For instance, in Germany and Japan banks and other term lending institutions hold a majority of shares and have their representation on the board of directors. That means, as Bothwell (1980) and others argued, a 30 percent or more of shareholding by outsiders neutralizes managerial control of the corporation. (c) Debt financing has its own implications for business risk. Hence, traditionally a high leverage (debt-equity ratio) is expected to exert pressure on the management to maximize profits. For, as Grossman and Hart (1982, pp.108-109) argued, the managers lose their jobs and perks in case of default or bankruptcy. It can also be argued, following Grossman and Hart (1982,pp.108-109), that a high debt-equity ratio dilutes shareholder control and increases the possibility of managerial control. In all these cases, an increase in managerial control will be expected to lead to diversion of profits in the form of perks, excessive capital formation and so on. The reported price-cost margins will go down. The empirical evidence summarized in

Palmer (1973) and Bothwell (1980) generally support this view though some exceptions have been reported. See, for instance, Cubbin (1988,p.26). The reason for the negative result is mostly the possibility of a harmonious co-operative relationship between the managers and the shareholders in contrast to the antagonistic relationship generally postulated.

Takeovers and mergers are a sure indicator of the existence of owner control of corporate decisions. As such the empirical implications of takeover for the performance of a firm is considered an important test of corporate control. However, almost all empirical studies concluded that profitability reduces in the medium and long term following a takeover. The only positive effect is on the stock prices for a few weeks around the time of takeover. Otherwise even stock prices decline over the medium and long term. See, for comprehensive surveys of the literature, Jensen and Ruback (1983), Jensen (1988) and Scherer (1980). There are two major explanations of this observed regularity. (a) Takeovers may necessitate far reaching and expensive organizational changes. They are perhaps not so well anticipated as the product market profit potential. (b) Most of the takeovers necessitate purchasing shares at a price higher than the book value of the assets. Usually this will be financed by increasing debt. As Jensen (1988) puts it, this reduces the "free cash" flow. This is basically a result of the fixed interest obligations associated with debt financing. Further, an increase in the debt equity ratio reduces owner control and the associated increase in managerial control increases resource diversions and reduces the price-cost margins.

On the whole, the empirical studies of corporate control could not convincingly demonstrate the existence of either ex ante or ex post improvements in the price-cost margins. The problem is simply that there are many other changes occurring simultaneously and the currently available econometric techniques are not able to separate these effects sharply. Specification problems further add to the difficulty.

2.2.2.2 DISCRETIONARY MANAGERIAL BEHAVIOR

The existence of positive profits and management control of corporate decisions may give rise to the management diverting profits to other uses or not generating maximum profits. For, as Hicks (1935) put it, the best of all worlds may be quiet life. Several theories have been put forward in this context. All of them refer to the change in conduct of the firm given its potential performance.

The following alternatives have been generally examined. (a) Discretionary profits are distributed to the various input suppliers according to the preferences of the management (increasing managerial perquisites, allowing organizational slack, appropriating stock options at the expense of shareholders, etc.), (b) consolidating their market position (by increasing their market share through advertising and diversifying through capital expansion), and/or (c) viewing the market structure as a strategic variable open to their manipulation rather than as an exogenously determined state of nature (adopting entry preventing measures). See, for instance, Jacquemin and DeJong (1977, pp.159-178). The latter two aspects overlap with the specification of the structural variables. As of now the econometric formulations have not been able to distinguish between these two

effects. As such much of the empirical literature on the discretionary managerial behavior is confined to (a) above alone.

2.2.2.3 EFFECTS OF ORGANIZATIONAL STRUCTURE

The vast majority of empirical studies concentrate on the M-form hypothesis of Williamson (1970,p.134). The observed evidence is rather mixed and the reasons for the differences are also fairly well documented by now. One of the factors is the basic motivation for its adoption and the second is the possibility of behavior modification at various levels of management.

Consider first the motivations for the adoption of the divisional structure of organization in a diversified multiproduct firm. Four different aspects have been identified. (a) In general the capital markets are imperfect. In particular, they will not be able to calibrate the differences in profitability of different products and product strategies of firms. Consequently, the capital market cannot be expected to allocate the capital resources among the different products efficiently. The firms, when they recognize this problem, may create an internal capital market in the form of an M-form organizational structure. This organizational restructuring can be expected to improve the performance of the firm. Three different dimensions of this have been noted in the literature. (i) As Hill (1984, p.69 ff) noted, the decentralized management allows its officers the requisite time to consider strategic alternatives and hence make better choices. (ii) According to Williamson and Bhargava (1972,p.54), the M-form structure permits the firm to realize both strategic responsiveness (by central office allocation of capital to product divisions) and operating efficiency (due to decentralized

control of production in each of the divisions). These are the net beneficial consequences of internalizing certain failures of the capital market. (iii) Williamson (1970,p.134) initially argued that "the organization and operation of the large enterprise along the lines of the M-form favors goal pursuit and least-cost behavior more nearly associated with the neoclassical profit maximization hypothesis than does the U-form (functional) alternative". (b) It was recognized by Williamson (1970) and others that the necessity to process information and coordinate production decisions increases as the firm grows and adopts a diversified product strategy. The firm will adopt a M-form organizational structure to reduce the information impactedness. That is as the quotation from Williamson in (iii) above indicates, goal pursuit and least cost production strategy can be better achieved under the M-form organizational structure. (c) It has been observed that the specific assets of the firm need not be capital stock alone. Instead, asset specificity and organizational synergies may be observed even with respect to technology, marketing networks, labor skills, and so on. When confronted with such specificities the firm cannot benefit from the operation of an external market because the implicit business secrets cannot be maintained in the long run. In such a case the firm may feel that an internal allocation mechanism in the form of a M-form structure may be superior. (d) In some contexts, such as that of U.K.,Marginson (1985) and others noted that the influence of labor unions on the management is rather strong. Confronted by this environment divisionalized control has the advantage of isolating problems rather than spreading them across the organization.

The empirical studies usually find it difficult to isolate one or more of these factors as the genesis of the adoption of the M-form organizational structure. Further, published information is often inadequate to verify whether all of the M-form organizational features are satisfied or not. See, for instance, Williamson and Bhargava (1972), Armour and Teece (1978), Hill (1985), Hill and Pickering (1986), and Hamilton and Shergill (1992).

The empirical evidences do not always support the M-form hypothesis. In general, most studies of the U.S.A., such as Armour and Teece (1978), Teece (1981), conclude that M-form organizations perform better. Similarly, Steer and Cable (1978), Thompson (1981), and Hill (1985) found some evidences of M-form firms performing better in the U.K. However, the evidence for U.K., Germany and other countries is generally negative. See Cable (1988), FitzRoy and Kraft (1987), and Cable and Yasuki (1985).

Usually the poor performance of the M-form firms is attributed to the following features. (a) Williamson and Bhargava (1972), Armour and Teece (1978), and Hill (1984,p.65) feel that the central office involving itself in operational decisions of the product divisions causes the failure. (b) Hill and Pickering (1986,p.170) and others feel that neither the central office nor the divisional managers are under any compulsion to maximize profits given the decentralized structure. (c) FitzRoy and Kraft (1987,p.116) noted that unionization, strained relations between the divisions and central office due to inequity in the distribution of gains may be inimical to maximum efficiency operation. (d) Steer (1973) and Caves (1980) pointed out that the cost of reorganization into a M-form structure may be quite

high which reduces the observed price-cost margins.

In sum, it can be maintained that (a) there is a fairly rich spectrum of behavioral hypotheses, (b) both the theoretical and empirical formulations are as yet imprecise, (c) there are problems of econometric inference, and (d) constraints of data availability are severe. This literature does not as yet have the maturity of the structuralist paradigm.

2.3 STUDIES IN THE INDIAN CONTEXT

From about 1955 there was a major concern that industrial development was creating a high degree of monopoly power. As a result a number of restrictions, in the form of price controls, and monopoly and restrictive trade practices (MRTP) act have been operating. At least in the case of a few industries, which appear in the concurrent list, countervailing power was sought to be developed through public sector production. As such there is an a priori expectation that monopoly power and industrial concentration may not be powerful determinants of the price-cost margins. However, a recent study of Vaidya (1992) demonstrated empirically that Indian industry is much less competitive in comparison to its western counterparts. In any case, the effect of the inelasticity of demand on the price-cost margins should be examined more closely.

On the cost side there are also conflicting tendencies. Firstly, most of the foreign technology imported is of a large size due to the existence of economies of scale. Relative to the size and dispersion of the Indian market, this may be too large and reduce the number of firms. Secondly, the scarcity of capital resources have put a limit on the entry of firms. Thirdly, somewhat counter to the above trend,

small scale units have been encouraged as a matter of policy even when the diseconomies of scale are apparent. Fourthly, there is more of a trader psychology rather than profit maximizing entrepreneurship. Most firms divert possible profits to perks, providing amenities to the management and so on rather than attract corporate profit taxes and in some cases attract the MRTP provisions. In other words, the costs are expected to be high and discretionary managerial behavior may be rampant. Cost reduction has not been considered as important and/or reported accounting profits do not reflect it due to diversions.

In general, the structural variables operating in the Indian context are different from those observed in market economies. Similarly, firm specific variables, especially those that reflect managerial discretion, are likely to be important.

Corporate control variables, especially those related to the capital market, have an uncertain effect. Though the stock market has been in operation for a considerable length of time most of the firms in the corporate sector were only private limited companies until very recently. As such, the trader psychology alluded to above was not conducive to reporting maximum profits on the book of accounts. The owner and/or management control on the production operations of the firm and cost reduction, if any, have been the only major effects on the price-cost margins. In recent times, many of these firms have been public limited companies and are now open to greater scrutiny by the shareholders. As such they are beginning to show sensitivity regarding the reported profit rates, dividends paid, share prices and so on.

The broad scenario that emerges from this description is that the structuralist paradigm would be relatively weak and it would be necessary to examine the behavioral alternatives more carefully. However, the empirical literature almost exclusively deals with the structural approach.

Consider the effect of concentration on the price-cost margins. Sawhney and Sawhney (1973), Katrak (1980), and others reported a significant non-linear relationship in a few industries. In other industries, and for different time periods, Apte and Vaidyanathan (1982) found no such relationship. Gupta (1968) interprets the concentration ratio as a barrier to entry and found it to be significant. The size effect was somewhat more important in the studies of Barthwal (1977) and Nagarajan (1988).

Nagarajan (1988) examined many other structural variables, such as the degree of diversification, advertising intensity, the degree of vertical integration and so on. It was reported that only the degree of vertical integration had a significant effect.

Market strategy, especially the opening of export markets, was considered in some studies. Similarly, the influence of multinationals, with a somewhat different management structure, was also estimated. While Katrak (1980) reported a positive and significant influence of exports on profit rates, Siddharthan and Dasgupta (1983) reported the opposite result.

The study of Barthwal (1977) utilized the leverage variable as a reflection of cost and found it to be significant.

On the whole the empirical work on the structuralist paradigm is fragmentary and no attempt was made to explain or reconcile the

contradictory results.

Only the study of Mukhopadhyay (1985) examined the hypothesis regarding corporate control. Management was expected to have control of decision making if outside shareholders own less than 50 percent of common stock. Beset with problems of small samples and data problems it was concluded that the best inference was of no significant relationship.

It can be concluded that no meaningful attempt has been made to examine the behavioral hypotheses.

CHAPTER 3

MEASUREMENT OF THE VARIABLES

3.1 INTRODUCTION

The present study is based on the data for a cross-section of firms in four major industries, viz., chemicals, cotton textiles, electrical cables and goods, and general engineering¹. The basic sources of the data are the balance sheets, the profit and loss accounts, and the statements of the chairmen of these companies as published in the various issues of the Bombay stock exchange official directory. The data pertains to the years 1985-1992 in most cases. As Steer and Cable (1978,p.20) argued, this length of time is "thought to be sufficiently long for short-run influences in profit to be (minimum)....but sufficiently short so that most firms would have a stable organizational form over most of the period." A similar argument was also advanced by Grabowski and Mueller (1978,p. 333).

It is well known that the balance sheets, and profit and loss accounts do not contain any detailed description of the organizational structure and control, and any of the specific reasons which induced the management to effect changes in them over time. However, the statements of the chairmen contained an adequate amount of information

1. One of the drawbacks of industry level cross-section studies is that the effect of the industry specific environmental variables,viz.,the degree of concentration, number of firms and so on, cannot be captured by the analysis. It cannot be claimed that they are not important in explaining the performance of firms in specific industries. It can only be stated that the present methodology does not allow us to incorporate the market environment in all its detail into the analysis.

about these dimensions². This section provides a fairly detailed description of the operational aspects of the model specification. The finer details of the assembled data have been reported in the Appendix.

3.2 ENVIRONMENTAL VARIABLES (EN)

The following aspects are well known from the literature on product diversification in monopolistic markets. (a) Uncertainty in the product markets has been acknowledged as the major reason for horizontal integration into related products within the same industry. See, for example, Malmgren (1961), Nguyen (1984), and Eaton and Lipsey (1989). Similarly, as Teece (1980, 1982) noted, conglomerate diversification may be a result of asset specificity. However, expansion along this dimension is not necessitated so long as the market for the primary product is adequate to achieve the desired level of capacity utilization. In general, it can therefore be argued that fluctuations in the product markets are the major motivating factors behind horizontal integration. Hence, the coefficient of variation of sales (CVSI) has been defined as one of the environmental variables. That is, $CVSI = \text{standard deviation of net sales} / \text{mean net sales}$ (expressed as a percentage). (b) As Carlton (1979, pp.190 ff) remarked, uncertainty in factor supply is the major motivation for backward vertical integration. Similarly, fluctuating demand in the product markets and the uncertain demand for the factors may induce

2. A somewhat related data base was utilized by Hamilton and Shergill (1992) for their study of the corporate sector of New Zealand.

the input suppliers to undertake forward vertical integration into the output markets. The conventional measure of vertical integration is the total inventory to net sales ratio³. This will be a decision of the management (as such it will be considered along with the DM group below). However, fluctuations in this measure reflect the state of the market environment. Hence the coefficient of variation of this ratio (CVVI) has been defined as the other environmental variable⁴. This approach is in conformity with the emphasis of Leech and Leahy (1991,p.1433) on the riskiness of the firm's environment.

A perusal of the data indicated that several firms in the sample were private limited companies until a few years ago. They entered the stock market only recently. Their reported profits were generally higher in comparison to the others. This is in conformity with the observation of Mueller (1972), Grabowski and Mueller (1978), and Leech and Leahy (1991,p.1430) that young quoted companies are more profitable⁵. To capture this effect a dummy variable (DUMY) was

3. The other measure utilized in the empirical literature is the value added to sales ratio. This data was available from the Center for Monitoring the Indian Economy sources for only a few firms in our sample. Attempts have been made to use this variable in the framework of present study. However, no new insights emerged from such an exercise.

4. One further possibility should be noted. The inventory to sales ratio would be low if a large CVSI can be accommodated by ex post production adjustment. See, for instance, Carlton (1979,p.191) and Aiginger (1985). Otherwise, a high inventory to sales ratio reflects unintended inventory accumulation rather than vertical integration. Even so, CVVI contains information about the ex post flexibility of production which CVSI cannot capture.

5. In the early phases of the life cycle of a firm, or a group of products which it produces, the opportunities for investment are high. To attract adequate finances in order to undertake capital expansion the firm depends on the capital market. The management considers it essential to signal profit prospects by generating and announcing the maximum possible profits. However, as the firm matures and investment opportunities are saturated, the necessity for such signals becomes

defined as

DUMY : 1 if the firm was a public limited company for at least 8 years
0 otherwise.

This variable was included in the specification of the environment.
In sum, EN contains three variables, viz., CVSI, CVVI, and DUMY.

3.3 STRATEGY VARIABLES (ST)

Wrigley (1970), Rumelt (1974), Hill (1984) and several other authors who followed their major scheme of classification of corporate strategy view the different specific assets of the firm as the base on which the strategy is structured. In particular, both the static choice and the dynamics of strategy depend upon (1) the capital and technological flexibility to produce a variety of products, (2) the other common resources, as well as (3) the versatility of the marketing personnel. Hence, the strategy variables (ST) has been subdivided into five variables, viz., PRST, MSEL, DMND, MNCS, COMN. They have been defined in the following manner⁶.

PRST (product strategy based on the technological dependence of the

5. Contd.

rather weak. Discretionary managerial behavior manifests itself and profits are diverted towards organizational slack. This accounts for the lower profit rates reported by the mature firms.

6. It was not possible to rigorously follow the classifications adopted by Rumelt (1974) and Hill (1984). Rumelt's (1974, Ch.1) classification of strategy broadly emphasizes the subjective and company-specific character of the definition of basic business, viz., single-product and dominant-product firms and the bonds that link it to the company's other business, viz., related product and unrelated product groups. Further, Hill (1984, pp.58-9) pointed out that if the firm sells each of its products in different geographic markets divisionalization at the market level for each product is essential to obtain the advantages of M-form. However, this also involves duplication of some resources and a loss of efficiency. The data was inadequate to make such finer classifications.

product range)

- :1 if the products were mostly interdependent
- 2 if the products were somewhat related
- 3 if distinct groups were identifiable

Hence, a larger score indicates the likelihood of the adoption of a M-form organizational structure.

COMN (commonality of other resources including R and D, contracts, and marketing divisions)

- :1 if there was no such commonality
- 2 if some other resources were also common in production

MSEL (geographic dispersion of markets)

- :1 if the markets were purely indigenous
- 2 if the firm was selling both in the indigenous and international markets
- 3 if the firm was entirely export oriented

DMND (market relationships among products)

- :1 if they were mostly related
- 2 if somewhat related
- 3 if distinct groups are identifiable

Hence, a M-form organizational structure is more likely to emerge if DMND = 3.

MNCS (foreign brand name and equity participation)

-Three features were taken into account. (a) Exclusive use of a foreign brand name. (b) A mixture of a foreign brand name and an indigenous brand name. And (c) 51 percent or more of foreign equity holding.

Williamson (1971,p.378) argued that the multinational companies are

generally M-form in their parent countries and are therefore likely to insist on that in the host countries also.

- :1 if none of these features are found
- 2 otherwise.

3.4 ORGANIZATIONAL STRUCTURE VARIABLES (SO)

The following aspects must be kept in perspective while measuring the details of the organizational structure . (a) Divisionalization and decentralization of functions are the essence of almost all complex organizations. The U-form is organized on the basis of functional divisions (production, marketing, finance etc.,). However, the informational disadvantages associated with such an organizational structure as it grows in size results in its being replaced by a M-form structure organized along independent product lines and/or geographically dispersed markets as advocated by Chandler (1962), Williamson (1970) and others . The existence of divisions along these lines is the first essential feature of the M-form organizational structure. This is measured by

DIV (existence of divisionalization)

- :1 if there was no evidence of divisionalization
- 2 if divisionalization was observed but not all divisions were product divisions in the generalized sense defined above (in particular, one of the divisions could have been dealing with foreign contracts)
- 3 if the firm had product divisions

(b) Following Chandler (1992,p.82) and his earlier writings, it is well known that the growth of most of the corporations entail product

diversification and/or creation of new national and international marketing outlets. However, as Schwarz and Thompson (1986), Hill (1988, pp. 79 ff), Cable (1988, p.20) and Hamilton and Shergill (1992, p.97) noted, the choice of the nature of divisionalization depends on the tradeoff between various aspects like information flows and compliance requirements of decentralization. Since the main focus of this study is on the efficacy of the M-form structure divisionalization of independent product lines in the process of diversified expansion has been singled out.

A variable (DIVR) has been defined as

DIVR (the organizational arrangements for new product introduction)

- 1 if no new products were introduced or the new divisions were not product divisions (they could have been functional divisions instead)
- 2 if new product divisions were a result of acquisition or collaboration with other firms
- 3 if new products were introduced through separate product divisions.

(c) Williamson and Bhargava (1972), Williamson (1986, pp.180 ff), Hill and Pickering (1986) and several others noted that decentralization does not necessarily confirm autonomy to the divisional managers. For, "some divisionalized companies are essentially holding companies, in that they lack the requisite control machinery, while others are only nominally divisionalized, with the general office maintaining extensive involvement in operating affairs."- Williamson (1986, p.181). However, as Hill (1984, p.55) noted, it is essential to provide decentralized decision-making responsibilities to divisional

managers if the firm has to achieve beneficial motivational effects which contribute to profit. Thus, information on this operational autonomy is required to ensure that the M-form property is satisfied. However, as Hill (1988,p.81) pointed out, extensive unpublished insider information is necessary to measure this. (d) Strategic decisions regarding the functioning of the internal capital market and allocation of other common resources of the firm should be entrusted to the central executive officer whose staff alone can have the expertise in the market related information when confronted with volatile product markets. See, for instance, Williamson (1970), Hill (1984,p.55), Hill and Pickering (1986,p.67), Williamson (1986, pp.180 ff), Cable (1988,pp.13-16), Hill (1988,pp.67 ff), and Leech and Leahy (1991,p.1433). This aspect is introduced by defining KALN (capital allocation by the CEO)

- :1 if such powers were not discernible
- 2 if the allocation was not product-wise
- 3 if there was a product-wise allocation.

(e) The loss of control in a M-form organization cannot be fully neutralized only through the powers of the CEO to allocate capital to the divisions. In general, it is necessary to develop a more extensive internal control apparatus. In the present study, the IC have been included for separate analysis rather than subsume them under SO.

Thus, this methodology accounts for all the major aspects emphasized in the classification schemes adopted by Williamson and Bhargava (1972), Phillips (1976), Armour and Teece (1978), Steer and Cable (1978), Hill (1984, 1988), Hill and Pickering (1986), and Cable

(1988). However, a more comprehensive classification was not possible from the published data⁷.

3.5 INCENTIVES AND CONTROL VARIABLES (IC)

Almost all organizational structures involve some form of delegation of control to the divisional level. Hence, the actual level of control consists of that which is exercised both by the general manager as well as the managers at the divisional level. Four aspects have been singled out for analysis. (a) Divisionalization, especially of the M-form variety, involves extensive responsibility of the divisional managers. This requires specialized skills both in terms of technical knowledge as well as managerial expertise. Secondly, the divisional managers may have certain discretionary powers in so far as they have some discretion with respect to the profits generated. Thirdly, to elicit proper cooperation from the workers, which will be a precondition for generating the profits expected from them, the divisional managers may have to selectively yield to pressures from the labor union. Further, as Marginson (1985,p.41), Kinnie (1987,p.467),and Colling and Ferner (1992,p.216) noted, they may prefer to localize such problems by yielding selectively to divisional pressures. It can therefore be expected

7. From the classification scheme adopted in Williamson and Bhargava (1972) it appears that the vector (DIVR, KALN, autonomy of divisional operating decisions) is used to classify organizational structures in the following manner :

M-form : (3,3, have autonomy)
CM-form : (3,3, no autonomy)
H-form : (3,1 or 2,*)
U-form : (1 or 2, *,*)

where a * indicates that this characteristic is not important for the classification. However, even this much of an approximation was not possible with the available data.

that the percentage of wage payments in the total cost of goods sold (WAGE) will increase and constitute one of the major control dimensions⁹. (b) The autonomy of the divisional managers also affects the management of short run assets and the liquidity of the firm. Following the conventional industrial organization literature this is measured by the ratio of current assets to current liabilities (LQID). (c) In general, the relationship between the shareholders and the management is an implicit contract. That is, the shareholders invest their money in the firm's capital assets and agree to its utilization being determined by the management. In general, the understanding would be that the management endeavors to maximize the total net collective gains and also resolve the distribution problems equitably. However, the managerial preferences can be at variance with those of the shareholders. Further, the shareholders experience asymmetric information. For, the shareholders only have the current market information while the management has better inside information about the organization as well as the future prospects. This may lead the managers to deviate from the shareholder interest. In particular, if the debt-equity ratio (i.e., $DEBT = \text{total liabilities to networth}$) is low the maximum profit that can be generated will be large due to the low cost of financing capital assets. But the potential for a large cashflow may enable the managers to divert resources to satisfy their own personal interest. On the other hand, if the debt-equity ratio is

9. In general, the IC, DM, and PE variables have been measured as five year averages of the latest five years for which data was available. However, in a few cases data was not available or exhibited abnormal behavior for some years. In such cases all the available data was utilized. Further details can be obtained from the Appendix.

high the profit potential would be low but the management would be under pressure to generate it. See, for instance, Grossman and Hart (1982, pp. 108-9), Harris and Raviv (1991, pp. 306 ff), and Mahoney (1992, p. 65). In general, the debt-equity ratio (DEBT) is an important variable. (d) Owner's control of the decision making process has been a recurrent theme ever since it was pointed out by Berle and Means (1932). In general, it was observed that when the shareholding of specific groups of shareholders, namely the directors and managers, or institutional owners exceed a certain threshold they can exercise control over the decision making process. See, for instance, Jacquemin and DeJong (1977, p. 163), Bothwell (1980, p. 307), Chang and Choi (1988, p. 150), Leach and Leahy (1991, p. 1425), and Mahoney (1992, p. 66). Hence, the percentage of shareholding of the directors and their relatives (EQTY) has been included as another variable belonging to the IC classification.

3.6 VARIABLES REPRESENTING DECISIONS MADE (DM)

The basic decisions of the management can be classified into two broad groups - the generation of assets and the utilization of assets. The total net assets of the firm (ASET, measured in 10^9 Rs.) and its average rate of growth over the five years under consideration (GRTH) were utilized to represent the generation of assets. The latter variable is included to identify the tradeoff between profit and growth alluded to by Penrose (1959) and Marris (1971). Further, as Williamson (1971, p. 381) pointed out, "if the M-form hypothesis were to be extended to include multiple goals, a growth goal would be a most natural first extension." Integration into input production is one of

the aspects of utilization. This was measured by the degree of vertical integration (VRTI) defined as the percentage of total inventories to net sales. The second major aspect of the use of the resources is reflected by the rate of capacity utilization (CAPA, measured as the percentage of average installed capacity to licensed capacity for each product) and the volume of net sales (SALE, measured in 10⁹ Rs.).

3.7 PERFORMANCE MEASURES (PE)

There is no consensus on the measures of the performance of the firm which can be considered to be appropriate from the shareholder and/or management viewpoint. The two basic options generally considered are the rate of return on total assets or the shareholders' equity. However, in the short run, the payments to the shareholders will have to be made out of the sales revenue after meeting all costs and tax liabilities. Hence, three basic measures of performance have been chosen in this study. (a) The efficiency with which the short term market potential was converted into profits. This is represented by SHPT = the net profits as a percentage of net sales. (b) The net profits as a percentage of net assets (LOPA), on the other hand, reflects the extent to which the long run managerial processes were able to translate the long run potential into realized accounting profits. Further, the management may consider the reductions in the value of this variable as a reflection of the inappropriateness of the present asset composition and organizational structure to changing environment and make suitable changes in the long run strategy of the firm. See, for instance, Donaldson (1987). (c) The shareholder

interest can be reflected in the net profits as a percentage of networth (LOPT). It indicates the extent to which the shareholders' investments are being rewarded. Similarly, the management may also consider this to be an important measure if the outside shareholding of the capital assets of the firm is significant. In general, these are the three dependent variables adopted in Steer and Cable (1978,p.15). However, it should be recognized that LOPT is a crude proxy for the shareholder valuation of the firm. For, CAPM based measures, adopted in Teece (1981), Hitt and Ireland (1986), Varadarajan and Ramanujam (1990,p.469) and others, may be preferable in so far as they take even the debt financing and share prices into account. However, this could not be attempted with the available data.

CHAPTER 4

ORGANIZATIONAL ECONOMICS MODEL

4.1 METHOD OF ANALYSIS

The results for each of the performance measures were computed by a step-wise regression procedure. Variables were added in decreasing order of their contribution to \bar{R}^2 . Draper and Smith (1966, pp.171-172) provides the computational details and outlines the limitations of this approach. The Breusch and Pagan (1979) test of heteroscedasticity was utilized throughout because the number of observations was insufficient to estimate the White (1980) test consistently.

Consider the regression equation of the form

$$\hat{U}_i^2 = \alpha_0 + \sum_{j=1}^k \alpha_j X_{ij}^2$$

where $\hat{U}_i; i = 1, 2, \dots, n$ are the CLS estimated residuals and $X_j; j=1, \dots, k$ are the explanatory variables in the regression

$$Y_i = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + U_i$$

It is well known that nR^2 , from Breusch and Pagan (1979), where R^2 is the squared multiple correlation coefficient from the first regression, has a χ^2 -distribution with k degrees of freedom.

The White (1980) correction for heteroscedasticity was computed for all the estimated equations. It is given by

$$\beta_{vce} = [X' W^{-1} X]^{-1} [X' W^{-1} Y], \text{ where}$$

$$W = \begin{bmatrix} \hat{U}_1^2 & 0 & \dots & 0 \\ 0 & \hat{U}_2^2 & \dots & 0 \\ \dots & \dots & \dots & \dots \\ 0 & 0 & \dots & \hat{U}_n^2 \end{bmatrix}$$

4.2 THE REDUCED FORM MODEL

We begin with a word of caution in order to avoid misinterpretation of the following exposition. This section will mainly emphasize the central behavioral tendencies and robust general conclusions. However, we acknowledge that individual firms do differ significantly. For, it was found, utilizing additional data that was available, that subsample behavior was somewhat different. In general, extensive inside information about individual firms would be needed to undertake further detailed testing.

Table 4.1 provides a general summary of the characteristics of the sample. The most striking feature is the extent of similarity of the different industries rather than the differences between them. In general, all the industries experience (a) unstable product markets as reflected by a high CVSI (around 30 percent), and (b) uncertain input supply indicated by a high CVVI (around 25 percent). It might have been very difficult and also expensive for the firms to accomodate these uncertainties through changes in their organizational structure. Further, the short run adjustments in the decisions may be inadequate to accomodate unexpected short run market fluctuations. This may be the primary reason for the inability of the firms to convert long run profit potential (indicated by LOPA and LOPT) into realized short run profits (represented by SHPT).

The equations which explain the determinants of the short run and long run rates of profit may now be examined sequentially. Consider

the behavior of SHPT equation as represented in Table 4.2. The following observations are pertinent. (a) The positive sign on the liquidity variable in most of the equations indicates that the firms were facing working capital shortage. This suggests that the underutilization of capacity is due to the shortage of liquidity and not necessarily market demand. (b) Variables representing the decisions made (DM) generally operate on the cost side. They always appear with a positive sign. That is, economies of scale were not exhausted. In particular, CAPA has a positive sign in the case of chemicals and electrical goods. (c) VRTI has a positive sign in the case of electrical goods and general engineering. Two plausible arguments can be advanced to explain this. (i) VRTI results in a cost reduction and the elimination of uncertainty in the input supply. (ii) Vertical integration may result in greater monopoly power for the firm. See, for instance, Koutsoyannis (1982,p.308). However, the first explanation is more plausible in view of (b) above. (d) The VRTI variable appears with a negative sign in the case of cotton textiles. There are three reasons for this : (i) following Williamson and Bhargava (1972), and Caves (1980,p.74) it can be argued that vertical integration requires intricate divisional coordination. Under such conditions the manager of this division cannot be given the autonomy for operational decisions. Instead, the CEO has to interfere in his operations. This corrupts the M-form and reduces the operational efficiency. (ii) Koutsoyannis (1982,p.308) maintains that a significant increase in the overhead costs is indicated when the firm undertakes vertical integration. If the firm is confronted by fluctuating product markets it loses its flexibility and may find it difficult to cover the fixed costs. SHPT will then decline. (iii) In

the case of the cotton textile industry the inventories are mostly finished goods rather than raw materials. As such increases in unexpected inventory accumulation reduces profit. However, further experimentation, to check for consistency across industries, did not provide any conclusive evidence for this. (e) Since the general engineering industry has technology based product diversification strategies profits will increase whenever the ASET base improves. (f) The cotton textile industry is subject to fluctuating consumer tastes for variety. It is generally expected, following Leland (1972) and Lim (1980), that there will be excessive diversification into geographically dispersed markets with a view to stabilize the market share. Hence, a negative sign of DIVR confirms the surmise that they were diversifying beyond the profit maximizing level. However, the positive sign of SALE indicates that there might be further marketing economies which were not exploited. The diversification strategy necessitates growth of assets. A positive sign on GRTH signifies that the strategy was successful. Further, the positive sign on COMN indicates that the actual execution of the diversification strategy was in consonance with profit maximization. (g) The threshold value of EQTY (9-10 percent), as suggested by Jacquemin and DeJong (1977, p.163) and Chang and Choi (1988,p.150), is attained only in the context of the general engineering industry. It is generally expected that such shareholder control would be directed towards maximizing profits. The positive sign of the EQTY variable for general engineering confirms this hypothesis. (h) The electrical goods industry had the largest number (41 percent) of new entrants on the stock market. Such firms are generally expected to report high accounting profits to assure the shareholders of an adequate rate of

return. Hence, DUMY has a negative sign in this case.

Turning to the long run performance of the firms the LOPA equation, presented in Table 4.3, provides the following conclusions. (a) The profit potential, as represented by the diversification strategy, is important only in the case of general engineering. (b) The organizational control aspects are important in realizing the potential profits. In particular, WAGE (in the case of chemical industry) and DEBT (in the context of chemicals and electrical goods) appear with negative signs. These are indications of their cost increasing effects. (c) GRTH and CAPA have positive signs in the case of chemicals, cotton, and general engineering. Both the availability of assets to support the diversification strategy as well as their utilization are important for generating profits in the long run. (d) VRTI persists with a negative sign for the cotton textile industry. This result indicates that the problems alluded to in Caves (1980,p.74) and Koutsoyannis (1982,p.308) are the dominant explanations.

Purely from an accounting viewpoint, LOPT is nearly equal to LOPA $(1+DEBT)$. Hence, the results in Table 4.4, pertaining to the behavior of LOPT will be expected to have a combination of variables from the equations for LOPA and DEBT. The following salient points may be noted. (a) In the case of general engineering the diversification strategy, GRTH, CAPA, and DEBT are important. The appearance of DEBT in this equation indicates the greater control of the management who also own a large percentage of the common stock (highest value of EQTY). (b) For the case of chemicals, cotton textile and electrical goods industries the strategy variables (MSEL for chemicals and cotton, DMND and MNCS in the case of electrical goods) are important.

These are the major determinants of the capital structure of the firm (as represented by DEBT). GRTH and CAPA also appear with positive signs. (c) The negative sign on WAGE again indicates a cost increasing effect of divisional control. (d) In the cotton textile case a tendency towards excessive diversification has already been noted. The firms tend to tradeoff profits to obtain a long run stability of their market share. This Penrose (1959) effect is reflected by the negative sign associated with ASET.

It should also be noted that the variables representing market environment appeared in the SHPT equation but not in the LOPA or LOPT equations. This is an indication that the long run strategy and other decisions have been fully adjusted to the long run trend in CVSI and the expected changes in the market conditions. The inability to make short run changes to neutralize unexpected variations in the product markets is the only major explanation for the observed differences in SHPT, LOPA and LOPT.

To sum up the experiences of this model it should be noted that the success associated with the adaptations to the external market conditions and the effectiveness of the control exercised by the CEO towards the profit maximization objective are the central determining features of the long run profit position of the M-form firm and its realization in the short run. Conversely, the inability to effect cost control and/or adapt the organizational functioning to the purely unexpected short run market fluctuations makes the M-form structure vulnerable.

4.3 THE INTERACTION MODEL

One of the peculiarities of the empirical results of the previous section is that the SO variables have not shown the prominence which

the M-form literature attributes to them. A possibility exists that the effects of SO, IC, and DM are not additive and independent of one another. Instead, the organizational linkages may be far more complex. Further investigation is therefore warranted.

In general, it is not possible to argue that an organizational structure, even of the M-form type, automatically results in the requisite controls and managerial motivations. As Hill (1984,p.65) and Cable (1985,p.20) emphasized, this remains one of the strong assumptions. A relevant question for empirical analysis is the effect on corporate performance of the interactions of the organizational structure and control (SO X IC), and organizational structure and the actual decisions made (SO X DM). For, as Otley (1988,p.166) put it,"Control systems are probably best considered as a package, involving elements of both structure and (the) process (of control). In this control package, each element-organizational structure, accounting information systems more widely designed, reward and incentive systems and other control arrangements...-is likely to interact with other elements." Also see Varadarajan and Ramanujam (1990,p.475).

Consider the results pertaining to the SHPT equation as represented in Table 4.5. The following observations are pertinent.

(a) The liquidity variable persists with a positive sign in most of the equations. The only exception is the general engineering industry. (b) In the case of the chemical industry LQID appears along with KALQ which is the interaction term KALN X LQID. This can be interpreted in the following manner. Write

$$SHPT = \text{Constant} + (5.01 - 0.84 \text{ KALN}) \text{ LQID}$$

In general, the liquidity shortage experienced by the divisional

management is such that the capital allocation by the CEO, which has not been taking the liquidity constraint into account, has been counter productive. This may be purely a result of divisionalization being predominantly along the market lines. (c) In the case of general engineering, on the other hand, KALQ appears in the SHPT equation with a positive sign. Recall that in this industry divisionalization is mostly along product lines. Hence, capital allocation by the CEO has a positive impact on SHPT though shortages of short term working capital financing restricts the firms from achieving their potential profit. Since LQID does not appear separately in this equation it should be concluded that the effectiveness of the capital allocation by the CEO to product divisions crucially depends on their ability to execute it by obtaining adequate short term working capital. (d) For the cotton textile industry $DRLQ = DIVR \times LQID$ has a negative sign. The market based divisionalization and the need for higher inventory levels reduces the profit potential. As with the other two industries liquidity problems are evident even in this case. (e) The positive signs on the DM variables persist even in this model. The only exception is the VRTI variable in the case of the cotton textile industry. (f) Two interaction terms have negative signs in the case of the chemical industry. If the shortage of liquidity is taken to be one of the major explanations of the low capacity utilization then it is possible to argue that divisionalization along market lines would be efficient only when there is no liquidity constraint. This accounts for the negative sign on $DRCP = DIVR \times CAPA$. On the other hand, there appears to be a short run Penrose (1959) effect in that the firms are selling beyond profit maximizing levels in order to

consolidate their long run market shares. (g) In the context of the cotton textile industry, the unstable market position for any one product of the firm tends to induce it to diversify beyond the profit maximizing limit. This is the basic reason for the negative sign associated with the $DRSL = DIVR \times SALE$ variable. However, since the SALE variable appears in this equation with a positive sign it can be concluded that the profit position of these firms improves whenever they can increase their sales. (h) Recall that EQTY has a positive effect on SHPT in the case of the engineering industry. However, in the present version only the interaction term $DREQ = DIVR \times EQTY$ has a positive sign. Proper organizational structuring, by appropriate divisionalization and the management procedures implicit in such choices, alone can make the control exercised by the managers and their relatives effective. Conversely, it can even be argued that the high value of EQTY and the motivation to maximize profits may manifest itself in the form of choosing better organizational structures to achieve the objective more efficiently. (i) The interpretation of the other variables in these equations is the same as in the previous section.

The estimated LOPA equations, presented in Table 4.6, provide the following insights. (a) In the context of the general engineering industry the product diversification strategy represented by PRST is important for the long run profit potential. However, the appearance of DRLQ with a positive sign in this equation indicates persistent problems of short term financing of working capital. (b) The persistence of liquidity problems even in the context of the electrical goods industry is evident from the positive sign of KALQ in this equation. The conclusion regarding the possible success of

capital allocation by the CEO only when there are no liquidity problems is confirmed by the absence of KALQ in the SHPT equation. In other words, the CEO control in these firms is probably designed efficiently but the liquidity problems prevent its attainment. (c) $DRWG = DIVR \times WAGE$ has a negative sign in the context of the chemical industry. In general, divisionalization entails the need for specialized skills at the divisional level. Also, as Marginson (1985) and others pointed out, the managers at the divisional level may prefer to selectively concede the demand for higher wages and avoid production losses. This is a general problem with the M-form organizational structure. Such a control loss has the prospect of reducing the long run profit potential. (d) The interpretation of the other variables is the same as before.

Consider the returns to shareholder equity represented by the LOPT equation. The results are tabulated in Table 4.7. (a) For the electrical goods industry, the following observations are pertinent. (i) The managers and their relatives who own a relatively small share are able to influence divisionalization and exploration of new markets. In general, this has a positive effect on performance as indicated by the positive sign associated with the variables KAEQ and KALQ. (ii) The persistence of liquidity problems is reflected by the appearance of DRLQ and KALQ. (iii) Divisional pressures and possible loss of control by the CEO are indicated by the negative sign of the DRWG variable. (iv) As remarked earlier, the success of the divisionalization strategy depends upon the realization of the sales targets. This is reflected by the DRSL variable appearing in this equation with a positive sign. (b) The importance of divisional control is also evident in the case of chemicals and cotton textiles.

This is the general implication of the presence of the DRWG and DRSL variables in these two equations respectively.

The interaction model provides a strong support to the general observation that organizational control aspects, and not merely organizational structure, would be far more important. In other words, the usual assumption of the literature on the M-form organization that the goals of the CEO and the divisional managers can be more nearly matched cannot be taken for granted. Control and auditing mechanisms must be built in to ensure this.

In general, two observations should be reiterated. (a) There is a persistent institutional problem with respect to the financing of the short term working capital. It would be worthwhile for the banking sector authorities to review this appropriately. (b) The success of an organizational structure depends upon the possibility of appropriate controls and monitoring. The control loss properties of decentralization should not be underestimated.

4.4 CONCLUSIONS

The empirical results of this chapter provide a strong indication that an appropriate organizational structure, even when it is in consonance with the strategy of the firm, cannot ensure the expected performance. The control aspects are important. Further, the IC variables are more likely to interact with the SO variables in generating the observed corporate performance. In some cases, the motivations of the divisional managers, as they translate to DM, have an important effect. The interaction between SO and DM is also important.

It was suggested in the literature that the CEO accumulates information about the nature of the decisions of the divisional

managers, the extent of compliance and so on. The CEO may then attempt to change the strategies and influence the environment as well. In general, there can be many more interaction effects⁴. More fundamentally, there can be multiple directions of causation which cannot be satisfactorily captured by either the reduced form or the interaction models⁵. That is, as Mueller (1992,p.166) pointed out, it would not be sufficient to explain the performance alone using single equation models. Instead, it can be concluded with Armour and Teece (1978,p.112) that the "performance equation is probably one equation in a system of equations in which performance, internal structure, size and growth are jointly determined. However,... it may be realistic to view such a system as being recursive." One step in this direction is the business policy model of the Harvard business school which exhibits the motivations and behavioral patterns underlying the complex interactions of the various aspects of the business policy. Empirical experiences with such a model are reported in chapter 5.

4. The following types of interactions have been outlined in the organizational economics literature.

- (a) EN X ST - Caves (1980,p.79) and Otley (1988,p.92)
- (b) EN X SO - Penrose (1959) and Hitt and Ireland (1986,pp.404-5 and 409 -10)
- (c) ST X SO - Steer and Cable (1978,p.18), Caves (1980,p.79), Donaldson (1987), Hill (1988,p.71), Otley (1988,p.97), and Hamilton and Shergill (1992).
- (d) ST X IC - Steer and Cable (1978,p.13), Routamaa (1985,p.515), Otley (1988,p.87), and Balakrishnan and Fox (1993,p.4).
- (e) IC X DM - Steer and Cable (1978,p.18), Hill (1988,p.71), and Balakrishnan and Fox (1993,p.4).
- (f) Interactions of variables within the IC group have been considered by Steer and Cable (1978,p.25). Within ST group interactions have been highlighted in Donaldson (1987). However, the data was inadequate to draw any reliable inferences about such wide ranging interactions.

5. Mueller (1992,p.148) put it in more general terms. "To understand the corporation, and the important role it plays in the economy, we need to build our analysis on a richer behavioral foundation."

TABLE 4.1: (Contd.)

SL.NO.	ELECTRICAL		ENGINEERING	
	\bar{X}	C.V	\bar{X}	C.V
1.	28.948	52.358	29.521	51.664
2.	28.503	85.729	23.013	74.922
3.	0.588	83.666	0.857	40.825
4.	2.059	38.966	1.679	47.908
5.	1.647	29.014	1.679	27.823
6.	2.000	38.348	1.964	46.104
7.	1.706	26.710	1.714	26.352
8.	1.177	32.404	1.464	34.059
9.	2.000	42.008	2.429	37.203
10.	2.000	29.704	2.036	20.684
11.	2.530	23.943	2.893	10.692
12.	11.129	81.222	16.733	60.111
13.	1.360	26.555	1.445	27.690
14.	2.908	34.378	3.406	101.870
15.	5.444	105.090	9.387	127.950
16.	0.567	84.501	0.463	130.680
17.	0.808	57.738	0.501	96.229
18.	31.701	72.003	31.384	65.510
19.	52.290	53.500	56.253	40.110
20.	0.682	99.321	0.582	133.940
21.	5.368	78.620	5.788	80.690
22.	4.972	51.644	6.026	67.338
23.	18.353	44.207	21.376	82.737

Table 4.2:

SHPT Equation (reduced form)

Variable	Chemical		Cotton(a)		Cotton(b)	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	-0.78 (0.39)	-0.10 (0.18)	-1.36 (0.56)	-1.00 (1.04)	2.29 (2.46)	2.52 (10.55)
DUMY	-1.94 (1.88)	-2.32 (7.19)	-	-	-	-
CVVI	-	-	-	-	-	-
COMN	-	-	0.50 (1.14)	0.50 (4.45)	0.67 (1.32)	0.81 (8.19)
DIVR	-	-	-	-	-0.71 (1.47)	-0.86 (7.28)
EQTY	-	-	-	-	-	-
LQID	3.15 (5.79)	2.98 (21.67)	3.85 (2.06)	3.38 (5.69)	-	-
CAPA	0.04 (2.55)	0.04 (17.59)	-	-	-	-
VRTI	-	-	-0.08 (2.38)	-0.07 (9.81)	-	-
SALE	-	-	-	-	1.19 (1.75)	0.93 (6.33)
ASET	-	-	-	-	-	-
GRTH	-	-	2.10 (2.03)	2.10 (4.67)	-	-
\bar{R}^2	0.84	0.99	0.87	0.99	0.84	0.99
DF(t)	45	45	16	16	17	17
BP	11.96	-	4.55	-	9.34	-
DF(BP)	3	-	4	-	3	-

TABLE 4.2: (Contd.)

Electrical		Engineering	
CLS	WCE	CLS	WCE
-4.82 (1.46)	1.39 (0.58)	-0.54 (0.14)	-1.43 (1.09)
-5.77 (3.93)	-4.86 (6.42)	-	-
-	-	0.13 (2.55)	-0.12 (3.31)
-	-	-	-
-	-	-	-
-	-	0.13 (1.68)	0.15 (5.07)
7.66 (3.74)	4.87 (2.77)	2.61 (1.15)	3.16 (3.20)
0.04 (1.34)	0.03 (2.09)	-	..-
0.04 (1.35)	0.05 (4.71)	0.10 (2.17)	0.09 (5.17)
-	-	-	-
-	-	2.55 (1.69)	2.62 (5.87)
-	-	-	-
0.84	0.87	0.70	0.98
12	12	22	22
11.72	-	13.59	-
4	-	5	-

Notes :

- (i) CLS- Step-wise regression estimated by least squares
- (ii) WCE- White corrected estimator
- (iii) The numbers in the brackets are the t-values of the corresponding coefficients
- (iv) DF(t)- Degrees of freedom of the t- statistic
- (v) BP- Breusch and Pagan test of Heteroscedasticity
- (vi) DF(BP)- Degrees of freedom of the BP test which is asymptotically a χ^2 -distribution
- (vii) Whenever two different equations were available after completing the step-wise procedure both the equations have been reported.

Table 4.3: LOPA Equation (reduced form)

Variable	Chemical		Cotton(a)		Cotton(b)	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	7.72 (3.77)	7.99 (20.38)	3.14 (4.46)	3.24 (15.38)	5.22 (3.23)	5.01 (30.74)
DUMY	-	-	-	-	-	-
PRST	-	-	-	-	-	-
WAGE	-0.14 (1.86)	-0.15 (18.76)	-	-	-	-
DEBT	-1.79 (6.05)	-1.97 (22.77)	-	-	-	-
CAPA	0.03 (1.51)	0.03 (12.21)	-	-	-	-
VRTI	-	-	-	-	-0.08 (1.42)	-0.07 (14.16)
GRTH	4.35 (2.97)	4.19 (18.83)	4.04 (2.09)	2.96 (4.49)	3.63 (1.90)	2.99 (6.91)
\bar{R}^2	0.84	0.99	0.77	0.97	0.79	0.99
DF(t)	44	44	19	19	18	18
BP	18.22	-	6.14	-	5.63	-
DF(BP)	4	-	1	-	2	-

Table 4.3: (Contd.)

Electrical		Engineering	
CLS	WCE	CLS	WCE
8.89 (4.62)	8.26 (16.20)	-1.66 (0.75)	-1.73 (1.33)
-1.85 (1.55)	-1.72 (6.60)	-	-
-	-	-1.57 (1.97)	1.55 (4.51)
-	-	-	-
-0.97 (1.66)	-0.78 (4.87)	-	-
-	-	0.05 (1.84)	0.05 (3.16)
-	-	-	-
-	-	4.30 (3.26)	4.23 (4.78)
0.83	0.99	0.79	0.94
14	14	24	24
4.19	-	18.83	-
2	-	3	-

Table 4.4: LOPT Equation (reduced form)

Variable	Chemical		Cotton(a)		Cotton(b)	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	8.14 (1.34)	9.05 (9.82)	14.06 (5.22)	14.74 (26.69)	7.39 (1.20)	9.36 (5.27)
DUMY	-4.37 (1.46)	-3.46 (4.83)	-	-	-	-
MSEL	3.43 (1.29)	3.32 (5.01)	-	-	4.42 (1.21)	3.61 (3.81)
DMND	-	-	-	-	-	-
MNCS	-	-	-	-	-	-
KALN	-	-	-	-	-	-
EQTY	-	-	-	-	-	-
DEBT	-	-	-	-	-	-
WAGE	-0.27 (1.31)	-0.35 (6.73)	-	-	-	-
ASET	-	-	-5.21 (1.09)	-4.94 (3.61)	-	-
SALE	-	-	-	-	-	-
VRTI	-	-	-	-	-	-
CAPA	0.07 (1.62)	0.07 (8.46)	-	-	-	-
GRTH	10.95 (3.16)	10.37 (10.14)	10.84 (1.44)	10.68 (3.48)	-	-
\bar{R}^2	0.89	0.99	0.77	0.98	0.77	0.99
DF(t)	43	43	18	18	19	19
BP	12.69	-	10.18	-	11.75	-
DF(BP)	5	-	2	-	1	-

Table 4.4: (Contd.)

Electrical(a)		Electrical(b)		Engineering	
CLS	WCE	CLS	WCE	CLS	WCE
9.23 (2.18)	9.02 (5.04)	1.44 (0.19)	-1.22 (0.53)	-12.15 (1.43)	-12.73 (4.67)
-8.52 (3.80)	-8.81 (17.56)	-10.84 (3.70)	-11.36 (16.92)	-	-
-	-	-	-	-	-
-	2.42 (1.53)	3.26 (6.29)	-	-	-
4.04 (1.17)	4.78 (2.39)	-	-	-	-
-	-	5.33 (2.12)	6.06 (7.67)	-	-
0.59 (2.98)	0.59 (25.99)	-	-	-	-
-	-	-	-	3.81 (4.98)	3.06 (4.89)
-0.74 (4.15)	-0.75 (3.51)	-0.44 (2.35)	-0.50 (10.29)	-	-
-	-	-	-	-	-
-	-	-	-	3.58 (1.11)	4.29 (6.29)
0.36 (5.03)	0.35 (28.55)	0.31 (4.82)	0.33 (17.66)	-	-
-	-	-	-	0.25 (2.26)	0.27 (7.47)
3.68 (1.37)	4.07 (7.09)	-	-	8.61 (1.59)	8.10 (7.05)
0.96	0.99	0.95	0.99	0.78	0.98
10	10	11	11	23	23
2.41	-	5.18	-	11.47	-
6	-	5	-	4	-

Table 4.5: SHPT Equation (with interaction)

Variable	Chemical		Cotton(a)		Cotton(b)	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	-2.45 (1.79)	-2.44 (19.23)	-1.01 (0.39)	-1.69 (3.92)	0.72 (0.76)	0.75 (10.77)
DUMY	-	-	-	-	-	-
CVVI	-	-	-	-	-	-
COMN	-	-	0.98 (2.05)	0.94 (10.49)	0.73 (1.47)	0.83 (7.98)
LQID	6.07 (5.10)	5.01 (6.63)	4.33 (2.08)	4.69 (17.71)	-	-
ASET	-	-	-	-	-	-
SALE	-	-	-	-	6.53 (2.03)	5.52 (9.92)
VRTI	-	-	-0.08 (2.48)	-0.08 (26.77)	-	-
CAPA	0.12 (4.15)	0.13 (35.34)	-	-	-	-
DREQ	-	-	-	-	-	-
KALQ	-1.21 (2.45)	-0.84 (3.25)	-	-	-	-
DRLQ	-	-	-0.51 (1.33)	-0.43 (5.73)	-	-
DRCP	-0.03 (2.32)	-0.03 (21.85)	-	-	-	-
DRSL	-0.14 (1.39)	-0.13 (9.17)	-	-	-2.68 (1.75)	-2.30 (9.10)
\bar{R}^2	0.86	0.99	0.86	0.99	0.85	0.99
DF(t)	43	43	16	16	17	17
BP	17.27	-	9.03	-	10.29	-
DF(BP)	5	-	4	-	3	-

Table 4.5: (contd.)

Electrical		Engineering	
CLS	WCE	CLS	WCE
-4.82 (1.46)	-1.39 (0.58)	-0.18 (0.05)	-1.17 (1.31)
-5.77 (3.93)	-4.86 (6.42)	-	-
-	-	-0.13 (2.61)	-0.12 (5.76)
-	-	-	-
7.66 (3.74)	4.87 (2.77)	-	-
-	-	2.45 (1.63)	2.55 (4.67)
-	-	-	-
0.04 (1.35)	0.05 (4.71)	0.10 (2.19)	0.08 (4.54)
0.04 (1.34)	0.03 (2.09)	-	-
-	-	0.07 (1.25)	0.09 (5.02)
-	-	0.85 (1.26)	1.13 (3.48)
-	-	-	-
-	-	-	-
-	-	-	-
0.84	0.97	0.70	0.94
12	12	22	22
11.72	-	13.54	-
4	-	5	-

Table 4.6: LOPA Equation (with interaction)

Variable	Chemical		Cotton	
	CLS	WCE	CLS	WCE
CONS	7.97 (4.07)	8.27 (16.27)	5.22 (3.23)	5.01 (30.74)
DUMY	-	-	-	-
PRST	-	-	-	-
DEBT	-1.83 (4.20)	-1.98 (20.61)	-	-
GRTH	4.27 (2.95)	3.96 (13.68)	3.63 (1.90)	2.99 (6.91)
CAPA	0.03 (1.43)	0.03 (8.07)	-	-
VRTI	-	-	-0.08 (1.42)	-0.07 (14.16)
DRWG	-0.06 (2.19)	-0.07 (16.49)	-	-
KALQ	-	-	-	-
DRLQ	-	-	-	-
\bar{R}^2	0.84	0.99	0.79	0.99
DF(t)	44	44	18	18
BP	19.82	-	5.63	-
DF(BP)	4	-	2	-

Table 4.6: (Contd.)

Electrical		Engineering	
CLS	WCE	CLS	WCE
4.15 (2.14)	3.94 (4.36)	-2.45 (1.06)	-2.57 (2.42)
-3.39 (3.49)	-2.59 (4.55)	-	-
-	-	1.13 (1.29)	1.24 (5.02)
-0.48 (1.05)	0.41 (1.57)	-	-
-	-	3.63 (2.55)	3.61 (4.99)
-	-	0.05 (1.65)	0.04 (2.40)
-	-	-	-
-	-	-	-
1.18 (3.59)	1.05 (4.88)	-	-
-	-	0.71 (1.17)	0.82 (8.37)
0.91	0.99	0.79	0.99
13	13	23	23
6.59	-	16.11	-
3	-	4	-

Table 4.7: LOPT Equation (with interaction)

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	11.67 (2.59)	11.91 (25.69)	14.17 (5.31)	13.67 (27.69)	9.19 (3.53)	8.74 (6.18)	-12.15 (1.43)	-12.73 (4.67)
DUMY	-	-	-	-	-12.20 (5.38)	-11.22 (6.56)	-	-
DEBT	-	-	-	-	-	-	3.81 (4.98)	3.06 (4.89)
GRTH	12.17 (3.69)	12.25 (16.58)	8.14 (1.04)	4.14 (1.28)	-	-	8.61 (1.59)	8.10 (7.05)
ASET	-	-	-16.82 (1.51)	-24.03 (4.96)	-	-	-	-
SALE	-	-	-	-	-	-	3.58 (1.11)	4.29 (6.29)
CAPA	0.07 (1.54)	0.07 (8.34)	-	-	-	-	0.25 (2.29)	0.27 (7.47)
VRTI	-	-	-	-	0.44 (6.54)	0.43 (14.87)	-	-
DRLQ	-	-	-	-	-1.69 (1.19)	-0.89 (1.27)	-	-
DRWG	-0.18 (2.49)	-0.19 (15.90)	-	-	-0.29 (4.14)	-0.29 (8.77)	-	-
KALQ	-	-	-	-	2.70 (2.59)	1.99 (2.99)	-	-
KAEQ	-	-	-	-	0.11 (1.81)	0.13 (3.79)	-	-
DRSL	-	-	5.69 (1.15)	10.92 (3.80)	1.53 (2.04)	1.51 (2.97)	-	-
\bar{R}^2	0.89	0.99	0.78	0.99	0.98	0.99	0.78	0.98
DF(t)	45	45	17	17	9	9	23	23
BP	17.72	-	10.54	-	8.43	-	11.47	-
DF(BP)	3	-	3	-	7	-	4	-

CHAPTER 5

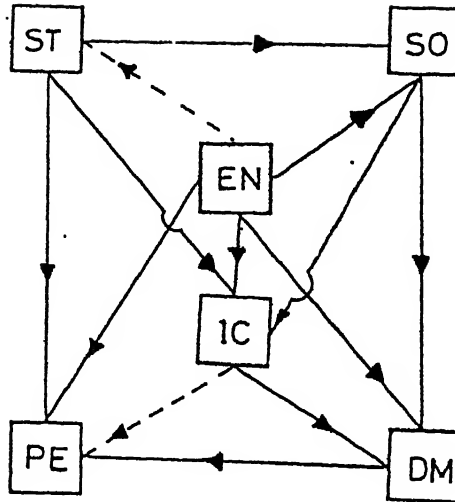
BUSINESS POLICY MODEL

5.1 MODELLING BUSINESS POLICY

The approach to business policy, embodied in Learned et al (1969, pp. 571 ff and 629 ff), can be summarized as in Fig. 5.1. However, in practice, most of the empirical studies have a relatively narrow perspective and examine only a few factors in isolation. This was noted explicitly in Varadarajan and Ramanujam (1990, p. 464). An attempt will be made in this section to reconstruct the general form of the model implicit in Learned et al (1969).

At the outset it should be recognized that the resources of the firm consist of its distinctive competencies. They represent the opportunities for the firm in its formulation of business strategy as well as its implementation. On the other hand, the product market conditions are predominantly exogenous to the firm. They define the constraints within which the firm should operate. These fluctuations in the product markets may have a long run trend, predictable short run fluctuations as well as purely unexpected random changes. Each of these features has a distinct effect on the determination of strategy, organizational structure, controls, decisions made as well as the observed performance of the firm. These differences must be acknowledged though it may be difficult to separate the different effects in empirical reality. Taken together these two aspects, i.e., the distinctive competencies and the market conditions, represent the environment of the firm.

Secondly, as Caves (1980, p. 66) and Naylor and Thomas (1983, p. 127)



EN - Environment
ST - Corporate Strategy
SO - Organizational Structure
IC - Incentives and Controls
DM - Decisions Made
PE - Performance

FIG 5.1
Business Policy Model

pointed out, strategic choice may encompass almost all functional areas. In practice, however, much of the business policy literature emphasizes product diversification and market expansion across regions within the country or internationally. In part, this may have been the result of the observed success of historic patterns as noted in Chandler (1962, 1992). Also see Teece (1982). Following Caves (1980,p.64) and Chandler (1992,p.82) it can be maintained that the strategies of the firm will be determined by the manager's perception of the market potential and the firm's distinctive competencies. In short, the long run environmental changes can be expected to determine strategy.

However, following Whittington (1988,p.526) and Lyles and Schwenk (1992,pp.157-8), it can be argued that it is not easy to define the market environment the way it is. For, it can be realized only through the perception of the management which has been built up over time in the form of distinctive competencies. Hence, the strategy of the firm depends upon the managerial perceptions of organizational potential and market prospects. This has led Caves (1980,p.74) to remark that there has been no satisfactory explanation of the causation between environmental factors and corporate strategy. As a result, following the suggestion of Chandler (1992,p.86) it would be more practical to represent strategy as exogenously determined.

The third aspect pertains to the choice of the organizational structure. In general, this refers to the managerial procedures utilized to coordinate, motivate, and appraise the contribution of the various organizational inputs. Two aspects have been identified as the main determinants of the organizational structure : (a) the

technology embodied in the production process, and (b) the strategy of the firm. Both Chandler (1962) and Woodward (1980) suggested a technological rationale for determining the nature of diversification and organizational form. In particular, a firm which is pursuing a strategy of diversification into technologically unrelated products will chose a M-form to be consistent with the requirements of an internal capital market. However, as Cable (1988,p.18) pointed out, a M-form organizational structure is not suitable in industries experiencing (i) rapid R and D and technical change, and (ii) process industries where technology does not allow divisionalization except at great cost. Following Mahajan et al(1988), and others, it is well known that changes in long term capital assets, organizational structure and so on necessitate fairly extensive change and can be time consuming as well as expensive. As such it would be reasonable to expect that changes in organization structure and control mechanisms are designed to take the long run environmental changes into account. On the other hand, as Hill (1988,p.69) and others before him noticed, the strategy of the firm may merely consist of diversifying the marketing of its product to different geographic areas. The head office may then direct the sales force (a common resource to the firm) along M-form lines. On the other hand, extensive interrelationships among products may necessitate the adoption of a U-form and foregoing the benefits of an internal capital market. See, for instance, Naylor and Thomas (1983,p.130) and Hill (1988,pp.19 ff). Thus, in general, the organizational structure is not a constant, but rather dependent on the organization strategy and the long run stability of the external environment. See, Child

(1974), Allen (1978), and Caves (1980,p.81). However, some studies, such as Hitt and Ireland (1986), Donaldson (1987), Hamilton and Shergill (1992) and the contingency theorists in general, emphasized the strategy-structure fit rather than strict causation.

Organizational control, distinguished explicitly from the organizational structure, has often been the fourth dimension of such models. In this context "Control is defined as the power to exercise discretion over major decision making"- Leech and Leahy (1991,p.1418). Clearly, decentralized decision making processes within the firm will not be automatically in consonance with its strategy and corporate objectives. For, as Cable (1988,p.20) argued convincingly, "profit-maximizing behavior of the top level remains only an assumption underlying the M-form hypothesis, and perhaps its strongest assumption. The desirable control properties of the M-form in constraining lower level behavior towards an overall objective, and avoiding organizational chaos after rapid and diversified expansion (cannot be taken for granted)." Instead, it may be expected, following Wintrobe and Breton (1986,pp.535 ff), that members of autonomous decision units may use their decision-making potential to make self-serving arrangements and undermine the overall organizational goals. Hence, for the organizational structure to be effective in coordinating operational decisions it is necessary to have an incentive machinery within the firm. Similarly, the central executive officer has to continuously monitor divisional performance to attenuate internal control loss and ensure that the expected performance materialized. For a detailed discussion refer to Phillips (1976,pp.27 ff), Teece (1981,p.174,footnote 5), and DeAlessi and Staff

(1987, pp. 5 ff). On the other hand, short run anticipated market fluctuations may necessitate some fine tuning of control as well as decisions being made. In practice, these short run market fluctuations cannot be neutralized by a change in strategy and/or organizational structure which are time consuming as well as expensive. In general, the requisite extent and nature of control depends upon the corporate strategy, organizational structure, and the nature of the external environment.

It is therefore recognized that the fifth aspect of the policy structure is the decisions made by the managers at different levels. Clearly, they will depend on the flexibility built into the organizational structure, the constraints which the control system places on the individuals at different organizational echelons, and the anticipated short run market fluctuations.

The final building block is the specification of the performance of the firm. In a broad general sense, it can be concluded with Learned et al (1969) that the observed performance would be the net effect of the potential identified by the strategy, the actual decisions which are a result of the managerial process consisting of the organizational structure and the control apparatus, and the independent effects of organizational control as well as short run unanticipated external market fluctuations.

In sum, recall that it would be difficult to ensure the stability of the relationship

$$ST = f(EN)$$

Hence, this will not be attempted. The rest of the recursive model can be summarized as follows:

$SO = f(EN, ST)$

$IC = f(ST, SO, EN)$

$DM = f(SO, IC, EN)$

$PE = f(ST, DM, IC, EN)$

It should be recognized that each of the building blocks contains many variables.

These details have already been specified in Chapter 3. To recall briefly,

EN contains the variables CVSI, CVVI, and DUMY

ST contains the variables PRST, MSEL, DMND, and COMN

SO contains the variables DIV, DIVR, and KALN

IC contains the variables EQTY, DEBT, LQID, and WAGE

DM contains the variables GRTH, SALE, VRTI, CAPA, and ASET

PE contains the variables SHPT, LOPA, and LOPT

5.2 EMPIRICAL FINDINGS

Consider the determinants of the organizational structure. The following inferences pertaining to divisionalization can be obtained from Table 5.1. (a) In the case of general engineering the existing divisionalization is along product lines and/or based on the use of common facilities. This reflects technological synergies. (b) At the other extreme, the divisionalization in the electrical goods industry is mostly along the lines of market expansion. This can be a result of the widely diffused markets for fairly standard products. (c) In the case of chemicals and cotton textiles it was observed that both horizontal diversification along product lines as well as geographic expansion of markets is important. In these two cases the wide range of consumers tastes for variety necessitate expansion into a wide

range of variety as well as catering to as many markets as possible in order to stabilize the market share. The dynamics of diversification can be inferred from the choice of DIVR.

The results exhibited in Table 5.2 are also in line with the above results concerning DIV. (a) The engineering industry is trying to take advantage of the technological synergies by expanding into new and unrelated products through divisionalization. In contrast, market stability requirements are evident in the case of chemicals, cotton, and electrical goods. All of them adopt a strategy of geographic dispersion of markets and implement it through a divisionalized organizational structure.

Table 5.3 summarizes the factors underlying capital allocation to the divisions (KALN) by the central executive officer (CEO). As expected, chemicals, cotton textile and electrical goods industries are affected by market fluctuations. Even in the case of general engineering the capital allocation is dictated by market conditions. This is in conformity with the M-form hypothesis that resource allocation is directed to maximize corporate profits.

The following general conclusions emerge with respect to the organizational structure. (a) Much of the divisionalization in these industries is along the lines of geographic dispersion of markets. As such it may not be difficult to adjust organizational structure to strategy. This is the basic reason for the validity of Chandler's (1962) hypothesis in the present study. (b) Though the KALN equations support the profit maximizing motivation for resource allocation by the CEO this cannot be considered as a strong evidence. For, though the average value of KALN is close to 3 the coefficient of variation

is fairly large.

The results concerning incentives and control can be systematized as follows. Consider Table 5.4 where the factors underlying the choice of EQTY are outlined. Two observations are pertinent. (a) In all industries (except cotton for which the equity data is not available) the multinationals exhibit a widely diffused shareholding. (b) In the case of electrical goods greater divisionalized expansion generally necessitates a reduction in the shareholding of directors and owners. In general, it can be concluded that the high variability of the product markets justifies spreading the risks rather than concentrating it in the hands of a few. Similarly, as Leech and Leahy (1992,p.1433) put it, "frequent changes in the environment require frequent adjustment to the deployment of productive assets and shareholders have a greater incentive to exercise control."

Table 5.5, representing the choice of the debt-equity ratio (DEBT) exhibits two salient properties. (a) In the case of general engineering and electrical industries the need for large investments necessitates greater equity participation. (b) In the case of chemical industry the market risks are high. If the management finances assets by issuing common stock there is a possibility that the risk in one or a few product lines may spread to the others as well and effectively reduce the share prices. The management opts for a higher debt-equity ratio to reduce the risks and maintain control. In general, it can be inferred that the capital requirements necessitated by the strategy, the management's desire to control the growth and allocation of capital formation, and the aversion to spread market risks across products to the enterprise as a whole determine the debt-equity ratio.

We now turn to the control exercised by the divisional manager on the operating decisions.

The results concerning the choice of liquidity (LQID) are exhibited in Table 5.6. The following aspects may be noted. (a) The chemical industry requires more working capital since it tends to increase inventory when confronted with product market fluctuations. However, the ability to diversify into different markets enabled it to successfully reduce the pressure on high liquidity requirements. (b) In the case of general engineering the product based diversification necessitates the divisions maintaining specialized inventories of raw materials and goods in process which tend to increase the working capital requirements. (c) During the time period under consideration global recession adversely affected both the textile and electrical goods industries. This resulted in high levels of unintended inventory investment. Exploring dispersed domestic as well as international markets add to the working capital requirements. However, such credit requirements are generally not fulfilled and these enterprises are led to economize. This result should be interpreted with caution since it may not be the general behavior pattern of all the firms in these industries.

The WAGE equations are presented in Table 5.7. Caves (1980,p.75) suggested that the M-form type of divisionalization necessitates greater expertise at the divisional level. Similarly, Marginson (1985,pp.141 ff) and Kinnie (1987,p.467) noted that the operational management may be compelled to pay higher wages to localize labor union problems and concentrate on fulfilling the divisional profit goals as best as possible. In other words, divisionalized firms can

be expected to exhibit a higher ratio of wage payments to sales revenue. This is the inference that can be drawn from the appearance of DIV in the chemical industry, PRST in the cotton textile case, MSEL in the electrical goods industry, and DIVR in the case of general engineering. The other observation that the multinationals pay their workers better cannot be interpreted on any behavioral terms. It is more of the nature of a statement of fact.

To sum up, it will be maintained that while the expected controls are operating both at the level of the general management and at the divisional levels they are mostly conditioned by the instability of the product markets and the maintenance of harmonious industrial relation at the divisional level. Aggressive profit maximization, even if this is being pursued, is subservient to this overall trend and it is not the dominant force driving the control process. Thus, it cannot be claimed that the movement towards a M-form organizational structure necessarily directs it towards profit maximization.

Both the strategic decisions and the operating decisions can be expected to depend on the organizational structure and control and modified by unexpected short run environmental changes. The essential results can be outlined in the following manner. Consider Table 5.8 in which the results for the ASET equation are presented. Two observations are generally valid with respect to all the four industries : (a) greater unrelated diversification implies investments in specialized assets and generally increases ASET requirement. (b) Such a diversification strategy generally entails an increase in the wage component and the overall costs. This has the effect of reducing the potential for capital formation. (c) In the case of chemicals, the

firms have been undertaking diversification into unrelated markets in order to counter market risks. As noted earlier, this tends to increase working capital requirements. This acts as a deterrent to capital formation by reducing both the free cashflow and profitability. This is the channel through which the negative effect of CVSI on ASET operates.

Table 5.9 details the results of the GRTH equation. Three salient features regarding the decision should be noted. (a) Unrelated divisionalization necessitates as well as enables firms to expand capital assets. (b) The working capital requirement of the chemical industry has been a deterrent to market oriented diversification and the growth of capital assets. The alternative interpretation that the spread of the markets, to the extent it is successful, can be conducted with a lower growth of assets appears implausible. (c) The peculiarity in this table is the appearance of EQTY in the equation for the engineering industry. This can be explained as follows. Note that EQTY is the highest (9.4 percent) in this industry and close to the threshold noted by Jacquemin and DeJong (1977,p.163) and Chang and Choi (1988,p.150). That is, such a shareholding by the directors and their relatives provides them a greater control of the firm and they are oriented to greater growth of assets.

The CAPA equations, reported in Table 5.10 indicate that, in general (except cotton industry where CAPA data is not available), the market uncertainty makes the firm risk averse and the management reduces capacity utilization. Similarly, the higher costs implied by a greater WAGE and DEBT restrict capacity utilization.

Consider the SALE equation in Table 5.11. Even these results suggest that the market fluctuations and the high cost implied by WAGE and DEBT inhibit the process of augmenting sales. However, diversification along the lines of unrelated markets and/or product lines has been helpful in mitigating this problem.

Decisions regarding VRTI, as displayed in Table 5.12, should be interpreted far more cautiously. The following aspects should be highlighted. (a) Conventionally the motivation for vertical integration is either the cost reduction possibility or the assured supply of inputs when confronted by fluctuating input markets. And attempts to reduce costs are necessitated due to the high cost implied by the increases in LQID and/or DEBT. Hence, there is a tendency for VRTI to increase with these variables. (b) In the case of the chemical industry, the negative sign of DIVR can be explained in two ways : (i) following Caves (1980,p.74) it may be a reflection of the unwillingness of the M-form organizations to undertake vertical integration which inhibits the decentralized control process and complicates the coordination of the top-level decisions. (ii) Alternatively, this is probably a reflection of the reduction in inventory indicated by successful market diversification rather than a reduction in the extent of vertical integration. (c) Similarly, the electrical goods industry appears to require greater inventory levels to implement its diversification strategy. The positive sign on DIVR is most probably a reflection of this phenomenon. In general, the behavior of VRTI equations reminds us that the inventory to sales ratio is an imperfect measure of vertical integration.

The corporate performance equations and their interpretations are

the same as in the previous chapter. However, the following additional support can be observed for a few variables in view of the business policy model. (1) The positive sign of the ASET variable in the SHPT equation for general engineering is in conformity with the technology based product diversification strategy. (2) For the general engineering industry the strategy variables are the major determinants of DEBT. Since DEBT appears in the LOPT equation with a positive sign it signals the greater control of the management. (3) Even in the case of chemicals, cotton, and electrical goods industries the strategy variables determine DEBT. The appearance of the strategy variables in the LOPT equation confirms the effect of the capital structure on LOPT.

5.3 CONCLUSIONS

The empirical experiences with the business policy model resulted in the following salient observations : (a) the diversification strategy is mostly along market lines and it is motivated mostly by the need to cushion market uncertainty. However, as Young (1928, p.536) argued, "(t)he search for markets is not a matter of disposing of a 'Surplus product',... but of finding an outlet for a potential product. Nor is it wholly a matter of multiplying profits by multiplying sales; it is partly a matter of augmenting profits by reducing costs." This requires a proper control of the organizational functions. (b) However, there is evidence to suggest that the problems at the divisional level increase costs and reduce the control of the general manager. This is in conformity with the observations of Marginson (1985, pp.141 ff) and Wintrobe and Breton (1986, pp.532 ff). (c) Most of the large business houses prefer to run the enterprises as

a family business rather than make room for professional management and trust their expertise. Thus, as evident from Fig.5.1, the success associated with the adaptation to external market conditions and the effectiveness of the control exercised by the CEO towards the profit maximization objective are the central determining features of the long run profit position of the M-form and its realization in the short run. Or, as Ouchi (1984,pp.6 ff) put it, the balance between the individual effort on the one hand and the team work on the other explains the success of the M-form. Conversely, the instability to effect cost control and/or adapt the organizational functioning to the purely unexpected short run market fluctuations makes the M-form vulnerable. See, for instance Bolton and Farrell (1990). Stable market environment, which makes the cost control aspect crucial, may be the most conducive to the success of the M-form.

Table 5.1: DIV Equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	0.73 (2.16)	0.38 (2.10)	-0.34 (0.31)	-0.53 (1.24)	0.55 (0.74)	-0.23 (0.07)	-0.26 (0.54)	-0.92 (7.16)
CVSI	-	-	0.03 (1.36)	0.04 (2.62)	-	-	-	-
PRST	0.23 (1.63)	0.01 (0.28)	0.46 (1.18)	0.34 (1.84)	-	-	0.18 (1.25)	0.01 (0.30)
MSEL	-	-	0.60 (1.36)	0.83 (2.60)	0.85 (2.01)	1.05 (5.46)	-	-
DMND	0.54 (3.49)	0.86 (11.50)	-	-	-	-	-	-
COMN	-	-	-	-	-	-	1.42 (5.67)	1.95 (28.84)
\bar{R}^2	0.92	0.99	0.84	0.96	0.87	0.97	0.95	0.99
DF(t)	46	46	17	17	15	15	25	25
BP	19.61	-	8.64	-	6.19	-	4.36	-
DF(BP)	2	-	3	-	1	-	2	-

Table 5.2: DIVR Equation

Variable	CHEMICAL		COTTON (a)		COTTON (b)	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	1.67 (7.69)	1.95 (36.93)	0.57 (1.02)	0.20 (0.76)	1.13 (5.59)	1.26 (8.59)
PRST	-	-	-	-	-	-
MSEL	-	-	0.30 (1.04)	0.58 (3.25)	-	-
COMN	-	-	0.34 (1.54)	0.27 (2.13)	-	-
DMND	0.22 (2.43)	0.03 (1.22)	-	-	-	-
CVSI	-	-	-	-	0.02 (1.46)	0.03 (5.02)
\bar{R}^2	0.95	0.99	0.87	0.97	0.87	0.99
DF(t)	47	47	18	18	19	19
BP	16.44	-	10.30	-	9.68	-
DF(BP)	1	-	2	-	1	-

(Contd.)

Table 5.2:

Variable	ELECTRICAL		ENGINEERING	
	CLS	WCE	CLS	WCE
CONS	1.25 (5.04)	1.22 (22.58)	1.82 (9.82)	1.99 (110.79)
PRST	-	-	0.13 (1.29)	0.01 (0.31)
MSEL	-	-	-	-
COMN	-	-	-	-
DMND	-	-	-	-
CVSI	0.03 (3.43)	0.03 (15.08)	-	-
\bar{R}^2	0.95	0.99	0.96	0.99
DF(t)	15	15	26	26
BP	5.33	-	4.65	-
DF(BP)	1	-	1	-

Table 5.3: KALN equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	2.57 (16.29)	2.92 (51.30)	1.77 (5.03)	1.72 (12.62)	1.73 (3.06)	1.20 (4.62)	2.79 (28.44)	2.99 (175.98)
CVSI	-	-	0.01 (1.03)	0.01 (1.51)	-	-	-	-
CVVI	-	-	-	-	-	-	0.01 (1.25)	0.0001 (0.35)
PRST	0.12 (1.56)	0.03 (1.29)	-	-	-	-	-	-
MSEL	-	-	0.25 (1.12)	0.26 (1.92)	0.47 (1.45)	0.84 (5.43)	-	-
\bar{R}^2	0.98	0.99	0.96	0.99	0.95	0.99	0.99	0.99
DF(t)	47	47	18	18	15	15	26	26
BP	8.67	-	13.68	-	9.22	-	4.44	-
DF(BP)	1	-	2	-	1	-	1	-

Table 5.4: EQTY Equation

Variable	Chemical		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	13.87 (3.18)	11.62 (8.00)	4.50 (0.66)	4.10 (1.79)	22.09 (3.24)	22.86 (5.07)
MNCS	-5.07 (1.68)	-4.45 (5.58)	-3.85 (1.05)	-4.79 (2.74)	-8.67 (1.97)	-9.07 (3.93)
MSEL	-	-	6.79 (2.17)	6.11 (5.91)	-	-
DIVR	-	-	-3.06 (1.33)	-2.11 (2.03)	-	-
\bar{R}^2	0.34	0.76	0.55	0.94	0.44	0.79
DF(t)	47	47	13	13	26	26
BP	6.98	-	7.15	-	10.78	-
DF(BP)	1	-	3	-	1	-

Table 5.5: DEBT Equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	1.99 (5.26)	2.11 (9.58)	0.42 (0.34)	1.05 (2.69)	3.57 (5.19)	3.59 (11.16)	5.91 (3.99)	5.45 (11.65)
CVSI	0.02 (1.65)	0.01 (1.74)	-	-	-	-	-	-
PRST	-	-	-	-	-0.32 (1.03)	-0.36 (2.64)	-1.49 (1.88)	-1.43 (8.31)
KALN	-	-	0.85 (1.65)	0.54 (2.89)	-	-	-	-
\bar{R}^2	0.83	0.98	0.83	0.99	0.89	0.99	0.53	0.89
DF(t)	47	47	19	19	15	15	26	26
BP	16.49	-	5.23	-	9.11	-	5.94	-
DF(BP)	1	-	1	-	1	-	1	-

Table 5.6: LQID Equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	2.33 (5.46)	2.35 (35.68)	1.30 (22.58)	1.30 (65.11)	0.81 (2.46)	0.76 (10.87)	0.94 (2.51)	1.08 (5.89)
CVSI	0.01 (1.36)	0.01 (6.19)	-0.01 (1.46)	-0.01 (4.41)	-	-	-	-
DMND	-0.44 (3.15)	-0.44 (25.19)	-	-	-	-	-	-
MSEL	-	-	-	-	0.32 (1.72)	0.35 (6.41)	-	-
DIVR	-	-	-	-	-	-	0.25 (1.39)	0.18 (1.93)
\bar{R}^2	0.83	0.99	0.99	0.99	0.94	0.99	0.93	0.99
DF(t)	46	46	19	19	15	15	26	26
BP	27.66	-	10.76	-	7.15	-	3.31	-
DF(BP)	2	-	1	-	1	-	1	-

Table 5.7: WAGE Equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	-4.27 (1.64)	-4.31 (27.84)	12.09 (2.02)	10.72 (5.96)	-11.34 (1.35)	-9.71 (2.39)	4.54 (0.48)	-1.98 (0.24)
MNCS	7.40 (4.99)	7.42 (93.02)	-	-	10.76 (2.04)	6.92 (1.79)	-	-
PRST	-	-	3.35 (1.21)	3.99 (4.62)	-	-	-	-
MSEL	-	-	-	-	5.75 (1.30)	6.77 (9.29)	-	-
DIV	1.89 (2.39)	1.89 (48.00)	-	-	-	-	-	-
DIVR	-	-	-	-	-	-	5.99 (1.32)	9.21 (2.21)
\bar{R}^2	0.84	0.99	0.89	0.99	0.71	0.99	0.74	0.98
DF(t)	46	46	19	19	14	14	26	26
BP	16.58	-	6.42	-	10.04	-	2.82	-
DF(BP)	2	-	1	-	2	-	1	-

Table 5.8: ASET Equation

	CHEMICAL(a)		CHEMICAL(b)		COTTON	
Variable	CLS	WCE	CLS	WCE	CLS	WCE
CONS	1.18 (1.46)	0.92 (7.64)	1.35 (1.69)	1.04 (5.85)	0.85 (3.08)	0.83 (26.19)
CVSI	-0.03 (1.84)	-0.02 (6.24)	-0.03 (2.04)	-0.03 (5.92)	-	-
DUMY	0.69 (1.24)	0.75 (13.04)	-	-	-	-
DIV	0.45 (1.74)	0.33 (6.32)	0.53 (2.14)	0.43 (8.28)	-	-
WAGE	-0.10 (2.59)	-0.08 (12.50)	-0.08 (2.27)	-0.06 (7.11)	-0.02 (1.64)	-0.02 (18.59)
\bar{R}^2	0.35	0.98	0.34	0.93	0.54	0.98
DF(t)	44	44	45	45	19	19
BP	8.09	-	8.67	-	1.83	-
DF(BP)	4	-	3	-	1	-
	ELECTRICAL		ENGINEERING			
Variable	CLS	WCE	CLS	WCE		
CONS	0.25 (0.81)	0.04 (0.59)	0.37 (1.11)	0.37 (53.44)		
CVSI	-	-	-	-		
DUMY	-	-	0.41 (1.22)	0.33 (9.38)		
DIV	0.16 (1.13)	0.26 (6.45)	-	-		
WAGE	-	-	0.02 (1.34)	-0.01 (6.82)		
\bar{R}^2	0.59	0.93	0.39	0.99		
DF(t)	15	15	25	25		
BP	5.87	-	1.92	-		
DF(BP)	1	-	2	-		

Table 5.10: CAPA Equation

Variable	Chemical		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	105.77 (8.23)	105.91 (46.56)	66.26 (4.41)	59.29 (6.77)	80.07 (9.39)	80.08 (54.60)
CVSI	-0.32 (1.17)	-0.38 (5.47)	-0.48 (1.05)	-0.28 (1.27)	-	-
CVVI	-0.50 (1.67)	-0.43 (9.55)	-	-	-	-
DEBT	-	-	-	-	-1.20 (1.09)	-0.44 (0.66)
WAGE	-1.92 (3.12)	-1.89 (23.27)	-	-	-1.89 (3.11)	-1.21 (11.59)
\bar{R}^2	0.89	0.99	0.78	0.94	0.89	0.99
DF(t)	45	45	15	15	25	25
BP	19.33	-	7.59	-	13.64	-
DF(BP)	3	-	1	-	2	-

Table 5.11: SALE Equation

Variable	Chemical		Cotton		Electrical		Engineering	
	CLS	WCE	CLS	WCE	CLS	WCE	CLS	WCE
CONS	2.82 (1.97)	3.06 (20.49)	0.88 (2.39)	0.90 (6.69)	-0.02 (0.05)	-0.08 (0.89)	0.35 (0.79)	0.31 (6.06)
CVVI	-0.04 (1.78)	-0.05 (13.37)	-	-	-	-	-	-
DUMY	-	-	-	-	0.55 (1.69)	0.05 (3.35)	-	-
DIV	0.70 (2.09)	0.69 (27.00)	0.11 (1.09)	0.04 (0.97)	0.19 (1.01)	0.02 (2.77)	0.25 (1.50)	0.22 (11.82)
WAGE	-0.15 (2.68)	-0.15 (34.94)	-0.03 (2.02)	-0.03 (4.77)	-	-	-0.02 (1.50)	-0.02 (8.22)
DEBT	-0.42 (1.63)	-0.44 (19.15)	-	-	-	-	-	-
\bar{R}^2	0.32	0.99	0.65	0.97	0.57	0.95	0.39	0.96
DF(t)	44	44	18	18	14	14	25	25
BP	2.58	-	6.66	-	2.65	-	3.84	-
DF(BP)	4	-	2	-	2	-	2	-

Table 5.12: VRTI Equation

Variable	CHEMICAL		COTTON	
	CLS	WCE	CLS	WCE
CONS	26.03 (4.67)	25.39 (14.14)	-5.19 (0.35)	3.54 (1.05)
CVSI	-	-	-	-
DIVR	-3.28 (1.47)	-3.15 (4.03)	-	-
DEBT	1.25 (1.32)	1.39 (8.15)	-	-
LQID	-	-	24.19 (2.04)	17.42 (6.59)
\bar{R}^2	0.89	0.99	0.89	0.99
DF(t)	46	46	19	19
BP	9.21	-	6.51	-
DF(BP)	2	-	1	-

Variable	ELECTRICAL(a)		ELECTRICAL(b)		ENGINEERING	
	CLS	WCE	CLS	WCE	CLS	WCE
CONS	15.29 (1.29)	12.79 (4.29)	0.89 (0.05)	1.91 (0.72)	18.89 (4.26)	18.56 (22.46)
CVSI	0.57 (1.57)	0.63 (5.74)	-	-	-	-
DIVR	-	-	15.41 (1.69)	14.86 (11.27)	-	-
DEBT	-	-	-	-	3.67 (4.02)	3.99 (10.78)
LQID	-	-	-	-	-	-
\bar{R}^2	0.69	0.95	0.69	0.99	0.81	0.99
DF(t)	15	15	15	15	26	26
BP	0.95	-	0.93	-	5.68	-
DF(BP)	1	-	1	-	1	-

CHAPTER 6

SUMMARY, LIMITATIONS AND POSSIBLE EXTENSIONS

6.1 SUMMARY OF FINDINGS

The present study was designed to examine the influence of business policy on corporate performance. The emphasis was on the firm level variables which affect corporate performance through (a) the managerial decisions which translate market potential into sales revenue, and (b) the costs of production resulting from specific organizational mechanisms. Such an analysis would be useful in providing guidelines for making the corporate sector more efficient in the process of implementing the liberalization policy which is recently put into effect.

Data relating to a cross-section of firms (averaged over five years to eliminate the purely short run market fluctuations) in specific industries was considered the most appropriate data base for such a study. Four major industries, viz., chemicals, cotton textiles, electrical cables and goods, and general engineering were taken up for the analysis. The data pertains to the more recent five years between 1985-1992 in most cases and was obtained from the Bombay Stock Exchange Official Directory.

The organizational economics literature was the natural source of alternative hypotheses in such a context. For, these studies often emphasize the extent to which specific organizational structures can (a) optimize the informational flows between the different echelons of the firm, and (b) reduce the control loss intrinsic to decentralized decision making within the firm. In general, only the performance equation has been considered and the reduced form approach has been

utilized to test the various hypotheses. The methodology is similar to the industrial organization literature which also considers the firm specific variables to have an independent and additive effect on its performance.

In particular, the following types of variables were included in the model specification. (a) The environmental variables which reflect the market conditions external to the firm, (b) the corporate strategy variables with respect to the products and markets, (c) the organizational structure variables with an emphasis of the M-form characteristics, (d) the ex post realization of the ex ante incentives and control variables implicit in the operation of the M-form structure, and (e) the variables representing decisions concerning the generation and utilization of capital and other assets of the firm. Three basic measures of performance have been chosen : (a) SHPT (the net profits as a percentage of net sales), (b) LOPA (the net profits as a percentage of net assets), and (c) LOPT (the net profits as a percentage of networth).

The reduced form model as suggested by the organizational economics approach was tested at the outset. The success associated with the adaptation to the external market conditions and the effectiveness of the control exercised by the CEO towards the profit maximization objective were the central determining features of the long run profit position of the M-form firm and its realization in the short run. Conversely, it was noted that the inability to effect cost control and / or adapt operational decisions of the organization to the purely unexpected short run market fluctuations made the M-form organization vulnerable. However, the variables representing the organizational structure per se have not shown the influence which the

M-form literature attributes to them. There was also an indication that the institutional arrangements to provide short term credit for working capital requirements were insufficient to stabilize performance when confronted with short term market fluctuations.

In general, it is not possible to argue that an organizational structure automatically results in the requisite controls and managerial motivations. Instead, control systems are probably best considered as a combination, involving elements of both the structure and the process of control. The additive specification is inadequate to reflect this satisfactorily. One alternative is to introduce the interaction of the organizational structure with control and the actual decisions made.

In general, two observations have emerged from the empirical results of the interaction model. (a) There is a persistent institutional problem with respect to the financing of the short term working capital. It will be worthwhile for the banking sector authorities to review this appropriately. (b) The efficacy of an organizational structure depends upon the existence of appropriate controls and monitoring. In particular, it was observed that appropriate controls were essential to ensure efficient performance even in those firms for which the organizational structures were chosen to fit their respective corporate strategies. The control loss problems of decentralization should not be underestimated.

More fundamentally, there can be multiple directions of causation which cannot be satisfactorily captured by the reduced form or the interaction models. Hence, it would not be sufficient to explain the performance alone using single equation models. Instead the performance equation is probably one equation in a system of equations

in which performance, internal structure, size and growth are jointly determined. The business policy model of the Harvard business school provides a framework through which the motivations and behavioral patterns underlying the complex interactions of the various aspects of business policy can be exhibited. Empirical experiences with such a model suggested the following properties regarding the business policy of the corporate sector : (a) the diversification strategy is mostly along product market lines and it is motivated mostly by the need to cushion market uncertainty. This requires a proper ex post control of the organizational decisions. (b) There is some evidence to suggest that the problems at the divisional level have increased costs and reduced the control of the general manager. (c) The balance between the individual effort on the one hand and team work on the other explains the success of the M-form organization. Stable market environment, which makes the cost control aspect crucial, may be the most conducive to the success of the M-form organizational structure.

As far back as Porter (1981) there was optimism that both the industrial organization studies and investigations of business policy are converging and that there is a chance of each of these enriching the other. However, the progress over the past decade has been rather fragmentary. In general, there is a need to strengthen the behavioral basis of the business policy approach. It can only be claimed that this study is a first step, albeit an important one, in understanding the influence of business policy on corporate performance.

6.2 LIMITATIONS AND POSSIBLE EXTENSIONS

Recall that the data for the present study has been set up by utilizing data obtained from secondary (published) sources. As Hamilton and Shergill (1992) remarked, such a data base has

limitations with respect to the details of the internal functioning of the firm. Extensive personal contact and involvement of corporate management would be necessary to make further useful progress in identifying the important aspects of ST, SO, IC, and DM as well as their determinants.

Cross-section studies are always confounded by the dominant characteristics of the time period over which they are defined. In the present case the recessionary trends and demand uncertainties in most of the markets were dominant. Most of the results reflected adjustments in strategy and structure emerging from these trends. It would be useful if similar studies are conducted for some other time period as well. In particular, it would be expected that cost reduction and technological change would have played a significant role during the seventies when major oil price changes were witnessed.

Teece (1981) and Hill and Pickering (1986,p.73) argued that the CAPM based measures of performance are more appropriate. For, they take several aspects of the capital structure into account. This would be a useful direction for further research in the framework of the present study.

Williamson and Bhargava (1972) and many others argued that the goals of the CEO may not be to maximize profit. Instead, they may pursue a growth maximization objective. Secondly, the divisions, operating autonomously, may not share the same objectives. It is rather difficult to estimate these managerial preference functions. But an attempt should be made along these lines.

The other methodological limitation is the statistical technique. In the context of a cross-section study heterogeneity of the characteristics of the individual business units is the dominant

feature. Hence, a given independent variable may have different effects on individual firms. As indicated in Balakrishnan and Fox (1993,p.14) an error components model may be a more appropriate choice.

Donaldson (1987), Hamilton and Shergill (1992) and the contingency theorists in general argued that there are pervasive interactions between strategy and organizational structure and other variables. A more detailed system specification may therefore be required.

In short, there is a need to strengthen the behavioral basis of the business policy approach. Thus, while enriching microeconomic theory it can also draw from it. This need was emphasized by Barney (1986,p.141) as well as Mueller (1992,pp.147-8). However, progress will be slow unless painstaking efforts at both the theoretical and empirical levels are forthcoming.

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APPENDIX

Recall from chapter 3 that the strategy and organizational structure variables had to be coded from the statements of the chairmen of the various companies. Since this involved some judgement this appendix details the procedures adopted. This will help the reader in reassembling the data or modifying it if there is a disagreement.

The following procedure has been adopted for the rest of the presentation.

- (1) Consider one industry; say, chemicals.
- (2) Take a firm in this industry. The relevant quotation(s) from the chairman's statement and the score value of each of the ST and SO variables has been recorded.
- (3) In general, most of the data pertains to the latest 5 years between 1985 and 1992.
- (4) The consolidated data for the industry has been assembled.
- (5) Note that data for only a few years has been utilized in the context of some of the firms. The notes at the end of the data table describe all such exceptions which became necessary in data compilation.

CHEMICALS, DYES, PHARMACEUTICALS, REFINERIES & PLASTICS

(1) HINDUSTAN LEVER, LTD.

PRST (3)

- . Conglomerate company using distinct technology for each product across product divisions.

MSEL (2)

- . The company was selling both in the domestic market as well as in the international market.

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 51.17% .
- . Use of foreign brand name LEVER.

COMN (2)

- . Common Marketing Department
- . Common R and D Department

DIV (3)

- . Soaps and Detergents Division; Chemicals Division; Vegetable Oil Plant.

DIVR (2)

- . Indexport Ltd., Levers Associated Trust Ltd., Levindra Trust Ltd., HindLever Trust Ltd., and Stepen Chemical Ltd., were the subsidiaries of the company.
- . The company set up a toilet soap plant in Sumerpur, catalyst plant in Haldia, vegetable oil plant in Kandla, marine products plant in KanyaKumari.

KALN (3)

- . Capital was allocated for the modernisation and expansion

programme from time to time.

. Capital was allocated for each plant as mentioned under DIVR.

(2) GUJARAT NARMADA VALLEY FERTILISERS, LTD.

PRST (3)

. Distinct groups are identifiable across product divisions.

MSEL (1)

. The company was selling in the domestic market.

. No information was observable on exports.

DMND (3)

. Conglomerate firm.

. Distinct groups are identifiable.

MNCS (1)

. Foreign equity holding was 5.95% .

. No use of foreign brand name.

COMN (2)

. Common R and D Department

. Common Market consultancy service

. Common Marketing Department

DIV (3)

. Urea Plant; Ammonia Plant; Methanol Plant; EPABX unit.

DIVR (2)

. Refer to the statement under DIV.

. Collaboration with (a) Texaco Development Corporation, U.S.A.;

(b) Haldor Topsoe, Denmark; (c) Linde Aktiengesellschaft, West Germany; (d) Snamprogetti, Italy.

. "Gujarat Narmada Auto Ltd. is a wholly owned subsidiary of the company...."

. "...a joint venture with Mozak International Inc., Abu Dhabi."

KALN (3)

- . "The company undertook to implement a captive power project...."
- . Capital was allocated for Gujarat Amino Chem. Ltd.
- . Capital was allocated for the capacity expansion of methanol plant.

(3) DEEPAK FERTILISERS & PETROCHEMICALS CORPN.LTD.

PRST (1)

- . The company was producing only a single product.

MSEL (1)

- . The company was selling in the domestic market.
- . No information was observable on exports.

DMND (1)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 12.80%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . The company had only one product division.

DIVR (2)

- . Collaboration with (a) Fish International Engineers Inc., U.S.A;
(b) Haldor Topsoe, Denmark; (c) Union Carbide Corporation,
U.S.A.; (d) Engineers India Ltd., India.

KALN (2)

- . "During 1990-91, the company undertook to implement projects for manufacture of resins and carbon-di-oxide/dry ice at a total estimated cost of Rs.75 crores."

. Rs.465 crores had been spent for an integrated project in order to produce nitric acid, ammonium nitrate methanol and ANP.

(4) TAMILNADU PETROPRODUCTS, LTD.

PRST (3)

. Distinct groups are identifiable across product divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1989-90	+ ve.	2.16
1991-92	+ ve.	+ ve.

DMND (3)

. Refer to the statement under PRST.

MNCS (1)

. Foreign equity holding was 9.92%.

. No use of foreign brand name.

COMN (2)

. Common R and D Department

. Common Marketing Department

DIV (3)

. Separate product divisions are observable within the same factory located in Madras.

DIVR (2)

. Refer to the statement under DIV.

. Collaboration with (a) UOP, U.S.A.; (b) UIL, India.

. "...a joint venture agreement with M/s. Henkel, W. Germany... for setting up a detergent project...."

KALN (3)

. "...The company was allotted 64,65,300 equity shares of Rs.10

each... in SFC."

Capital was allocated for the expansion and modernisation programme of each unit.

(5) ICI INDIA, LTD.

PRST (3)

- . The company was a conglomerate company.
- . Distinct technology was used for each category of products.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	758	12.10
1991-92	868	16.30

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 51.66%.
- . Use of foreign brand name ICI.

COMN (2)

Common R and D Centre
Common Marketing Department

DIV (3)

Blasting Explosive Division; Nitrocellulose Division; Fertilisers Division, Paints Division; Polythene Division; Chemicals Division; Crop protection Division.

DIVR (2)

Refer to the statement under DIV.

Collaboration with ICI, U.K.

"A Memorandum of understanding was entered into between the

company and Nalco Chemical Company, U.S.A. for the manufacture of speciality chemicals for industrial application."

"... The Alkali & Chemical corporation of India Ltd., Chemicals & Fibres India Ltd, and Crescent Dyes & Chemicals Ltd., were amalgamated with the company."

KALN (3)

. Capital was allocated for each product division from time to time.

(6) NATIONAL ORGANIC CHEMICAL INDUSTRIES, LTD.

PRST (2)

. Some common technologies were used.

. Some products were by-products.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1991-92	603	60.0

DMND (2)

. Products were somewhat complementary to each other.

MNCS (1)

Foreign equity holding was 33.46%.

No use of foreign brand name.

COMN (2)

Common R and D unit

Common Marketing Department

DIV (3)

Monocrotophos Plant; Petrochemicals Division; Agrochemical Division; Cypermethrin Plant; Benzene Plant.

DIVR (2)

Refer to the statement under DIV.

Collaboration with (a) Royal Dutch/Shell Group of Cos. & Universal Oil Products Co., U.S.A., (b) Bataafse Internationale Chemie Maatschappij N.V., Netherlands; (c) Farbwerke Hoechst AG, West Germany.

Joint venture with (a) Mupnar Films Ltd.; (b) Super fine Aromatic Co. Pvt. Ltd.

"Ensen Holdings Private Limited became a subsidiary of the company during 1987."

KALN (3)

. The company was allocated capital for the modernisation and expansion of each plant from time to time .

(7) POLYOLEFINS INDUSTRIES, LTD.

PRST (2)

. To some extent common technology was used across divisions.

MSEL (2)

. The company was selling both in the local markets as well as in the international market.

DMND (2)

. Products were somewhat related.

MNCS (1)

Foreign equity holding was 31.26% .

No use of foreign brand name.

COMN (2)

Common R and D Centre

Common Marketing Department

DIV (3)

Polymer Division; Rubber Chemicals Division; Plastic Products Division.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with (a) Hoechst A.G., West Germany and (b) I.C.I., U.K.

KALN (3)

- . Capital was allocated for each product division from time to time for the expansion, modernisation and introduction of new products.

(8) MODI ALKALIES & CHEMICALS LTD.

PRST (1)

- . The company was vertically integrated.
- . Same kind of technology was used across divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1991-92	77.20	9.80

OMND (2)

- . Products were somewhat distinct.

MNCS (1)

- . Foreign equity holding was 3.05% .
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D centre

DIV (3)

- . Caustic-chlorine Plant; Stable Bleaching Powder Plant; Caustic Concentration Plant.

DIVR (3)

- . Refer to the statement under DIVR.
- . A project was set up for the conversion of a graphite anodes to metal anodes.

KALN (3)

- . "During 1984-85, the company undertook to set up a project for the conversion of graphite anodes to metal anodes at a total cost of Rs.6.67 crores."
- . "During 1987-88, the company received a licence for enhancement of its caustic soda capacity...."
- . "During 1991-92, the company... proposed to further expand the capacity of stable bleaching powder...."
- . Capital was allocated for the modernisation of product divisions.

(9) FINOLEX PIPES, LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1988-89	38.28	6.57

DMND (1)

- . Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 0.04%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Technical collaboration agreement with undc Gmbh, West Germany.
- . "Finolex Polymers, Ltd. is a subsidiary of the company."

KALN (3)

- . Rs.352 crores was allocated for the Rampar Unit.
- . Rs.500 lakhs was spent to increase the capacity of the factory.

(10) RECKITT & COLMAN OF INDIA LTD.

PRST (3)

- . Distinct technologies were used across product divisions.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990	93.64	2.58

DMND (3)

- . Distinct products are identifiable.

MNCS (2)

- . Foreign equity holding was 40.06%.
- . Use of foreign brand name Reckitt & Colman.

COMN (2)

- . Common Marketing Department

DIV (3)

- . The company had three separate factories producing distinct products.

DIVR (2)

- . Refer to the statement under DIV.
- . "During 1986, a multipurpose chemical plant was set up at Hosur."

. "Atlantic (East) Ltd., was amalgamated with the company...."

KALN (3)

. Capital was allocated for the Hosur plant.

. Capital was allocated for the expansion and modernisation programme of the factories.

(11) RAMA PETROCHEMICALS, LTD.

PRST (1)

. The company was producing only one product.

MSEL (1)

. The company was selling in the domestic market.

. No information was available on exports.

DMND (1)

. Refer to the statement under PRST.

MNCS (1)

. Foreign equity holding was 34.70%.

. No use of foreign brand name.

COMN (1)

. Refer to the statement under DIV.

DIV (1)

. No separate product division is observable.

DIVR (2)

. Collaboration with (a) Lurg GmbH, West Germany;
(b) Osterreichsche Hiag-Werke GmbH, Austria and (c) Humphreys
& Glasgow Consultants Pvt. Ltd.

KALN (3)

. "The total cost of the company's methanol project was estimated at Rs.2,892 lakhs...."

. Capital was allocated for the capacity expansion of the existing

project.

(12) HOECHST INDIA, LTD.

PRST (2)

- . Somewhat common technology was used across product divisions.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1991-92	266.30	31.50

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 40.01%.
- . Use of foreign brand name HOECHST.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . Agro Division; Pharma Division; Industrial Division; Indent Business Division; Human Pharma Division, Veterinary Division.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with Farbwerke Hoechst AG, West Germany.
- . Roussel India, Ltd., Hoechst Nepat Pvt. Ltd., Pyrapura Chemicals, Ltd., Rainbow Investments Private Ltd. and Hextind Exports Private Ltd. became subsidiaries of the company.
- . During 1988-89, Human Pharma Division launched new products in the market.

KALN (3)

- . Capital was allocated for each product divisions from time to time for the capacity expansion, modernisation and introduction of new products.

(13) E.MERCK (INDIA), LTD.

PRST (2)

- . Some what common technology was used across product divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990	84.12	7.76

DMND (2)

- . Products were somewhat related.

MNCS (2)

- . Foreign equity holding was 41.75%.
- . Use of foreign brand name E.Merck.

COMN (2)

- . Common Marketing Department

DIV (3)

- . The company had three factories located in Maharashtra, M.P. and Goa producing distinct products.
- . Chemical Division is observable.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with E.Merck, West Germany.
- . "During 1987, the company acquired a significant shareholding in Suneeta Laboratories, Indore...."
- . "During 1987, a bulk drug unit, at Indore, manufacturing

chloroquine phosplate and its derivatives was acquired by the company."

KALN (3)

- . "In 1980, the company undertook substantial expansion at Talaja... and the cost of this expansion was estimated at Rs.185 lakhs...."
- . Capital was allocated for the Indore factory.

(14) BOOTS PHARMACEUTICALS LTD.

PRST (2)

- . Some what common technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1989-90	74.28	0.76

DMND (2)

- . Products were somewhat related.

MNCS (2)

- . Foreign equity holding was 40.23%
- . Use of foreign brand name BOOTS.

COMN (2)

- . Common Marketing Department.

DIV (3)

- . Formulation Factory located in Pune.
- . Chemical Plant located in Maharashtra.
- . Another Factory located in Bombay.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with Boots Pure Drug Co., Ltd., England.

. Beem Health care Ltd., became a wholly owned subsidiary of the company during 1990.

KALN (3)

. Capital was allocated to set up a new chemical plant in Ahmednagar.

. Capital was allocated for the modernisation and expansion programme of the three factories as mentioned under DIV.

(15) SANDOZ (INDIA), LTD.

PRST (3)

. Distinct groups are identifiable across product divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1991	180.48	30.41

DMND (3)

. Products were distinct.

MNCS (2)

. Foreign equity holding was 51.12%.

. Use of foreign brand name SANDOZ.

COMN (2)

. Common R and D Centre

. Common Marketing Department

DIV (3)

. Pharmaceuticals Division; Agrochemicals Division; Dyed & Textile Chemicals Division; Seeds & plant lets Division.

DIVR (2)

. Refer to the statement under DIV.

. Collaboration with Sandoz, Ltd., Switzerland.

. "The company took up a seeds and plant lets project...."

. "In 1959, manufacture of optical whitening agents and a number of textile chemicals were started."

KALN (2)

. Capital was allocated from time to time for the expansion and modernisation of each plant as well as for launching of new products.

(16) COLOUR-CHEM, LTD.

PRST (1)

. Same kind of technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1991-92	133.71	21.55

DMND (3)

. The company was producing intermediate products.

. Distinct groups are identifiable.

MNCS (1)

. Foreign equity holding was 32.92%.

. No use of foreign brand name.

COMN (2)

. Common Marketing Department

DIV (3)

. Roha Plant was producing intermediates organic chemicals.

. Thane plant was producing acrylic esters, etc.

DIVR (2)

. Refer to the statements under DIV.

. "Kundalika Investments Ltd., became a subsidiary of the

company...."

- . "Vanavil Dyes & Chemicals Ltd., is also a subsidiary of the company...."
- . "The company undertook to enter into a joint venture in Sri Lanka...."
- . "Farbenfabriken Bayer A.G. Leverkusen, West Germany and Farbwerke Hoechst A.G. Frankfurt, West Germany were the technical-cum-financial collaborators of the company...."

KALN (3)

- . Capital was allocated for Thane unit.
- . Near about Rs.30 crores were spent for upgrading the technology.
- . Capital was allocated to set up a plant at Roha factory.

(17) BLUE BLENDS PETROCHEMICAL LTD.

PRST (1)

- . In practice, the company was producing only one product.

MSEL (1)

- . The company was selling in the domestic market.
- . No information is observable on exports.

DMND (1)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 0.00% .
- . No use of foreign brand name.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . Ankleshwar plant was producing H.Acid, Gamma Acid etc.

- . Vapi Plant was producing Beta Naphthol, Benic Acid etc.

DIVR (2)

- . Refer to the statement under DIV.
- . In 1990, the Vapi plant was set up.
- . "During 1990-91, Miracle Investment Ltd., became a subsidiary of the company."

KALN (2)

- . "The total cost of the project was estimated at Rs.1,830 lakhs...."

(18) IDL CHEMICALS, LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (1)

- . The company was selling in the domestic market.
- . No information was available on export.

DMND (2)

- . Somewhat distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 41.70%.
- . Use of foreign brand name IDL.

COMN (2)

- . Common R and D Department

DIV (3)

- . PETN project; Bulk Explosive Unit; MIT Laboratories Division; Yamillin Project; Bitumen Emulsions Project; Gypsum Project; Oil Field Chemical Project.

DIVR (2)

- . Refer to the statement under DIV.

- . Joint venture was promoted under the name Eastern Explosives & Chemicals Ltd.
- . Mysore Industrial and testing Laboratories Ltd., Bangalore was amalgamated with the company.
- . DOW Chemical Company became a 100% subsidiary of the company.
- . M/S. Atlas Chemical Industries Inc., U.S.A., Imperial Chemical Industries Ltd., U.K. were the foreign collaborators of the company.

KALN (3)

- . The company was allocated capital from time to time for each unit/project as mentioned under the DIV.

(19) BURROUGHS WELLCOME (INDIA) LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	82.31	0.97

DMND (2)

- . Products were somewhat related.

MNCS (2)

- . Foreign equity holding was 40.09%.
- . Use of foreign brand name Burroughs Welcome.

COMN (2)

- . Common marketing Department
- . Common R and D Department

DIV (3)

- . Pharmaceutical Division; Chemical Division.

DIVR (3)

- . In 1981, construction of Organophosphate plant was completed.
- . During 1990-91, the pharmaceutical Division launched a product under the name Loxapine.

KALN (3)

- . Capital was allocated from time to time for the modernisation and expansion programme for each division.

(21) ROCHE PRODUCTS, LTD.

PRST (3)

- . Distinct products were produced by using separate technology by each plant.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1991-92	58.05	0.29

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 74.00%.
- . Use of foreign brand name ROCHE.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Pharamceutical Division; Fine Chemicals Division.

DIVR (3)

- . Refer to the statement under DIV.
- . The company launched various bulk drugs from time to time.

KALN (3)

- . Capital was allocated for vitamin A Plant, Bulk Drugs and wastes water Treatment Facilities.

(22) SHREE ACIDS & CHEMICALS LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (1)

- . The company was selling in the domestic market.
- . No information is available on exports.

DMNO (3)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 9.38%.
- . No use of foreign brand name.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . Sulphuric Acid Plant; Super Phosphate Plant; Paper Plant; Fertilizer Plant.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with (a) The Dharamsi Morarji Chemical Co. Ltd.;
(b) Chem Project Design and Engineering Co. Pvt. Ltd.
- . The company set up a captive pulping unit.

KALN (3)

- . Capital was allocated for the pulping Unit.
- . "In order to achieve better capacity utilisation in the single

phosphate plant the company installed certain balancing equipment at a cost of Rs.55 Lakhs."

(23) ALEMBIC CHEMICAL WORKS CO. LTD.

PRST (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	138.83	8.62

DMND (3)

- . Refer to the statements under PRST.

MNCS (1)

- . Foreign equity holding was 1.18%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Naomer Division; Veterinary Division; E.P. Division; Pampnarm Division.

DIVR (2)

- . Refer to the statement under DIV.
- . "Algen, Ltd., is a subsidiary of the company."
- . Alembic Distributors, Ltd. and Naomer Ltd. were amalgamated with the company.

KALN (3)

- . Captial was allocated for the multifilament yarn project.
- . In 1986, Capital was allocated for the E.P. Division.

- . During 1986-87, the company allocated capital for the launching of the two new products.

(24) J.B. CHEMICALS & PHARMACEUTICALS, LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	59.18	19.44

DMND (2)

- . Somewhat products were related.

MNCS (1)

- . Foreign equity holding was 2.73%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D centre

DIV (3)

- . The company had three factories located at different places.
- . Unique Pharmaceutical Laboratories was a separate product Division.
- . Belapur Unit produced chemical products
- . Thane Unit produced bulk drugs.
- . Ankleshwar unit produced different kinds of bulk drugs.

DIVR (2)

- . Refer to the statements under DIV.
- . Unique Pharmaceuticals Laboratories Pvt. Ltd. and Iflunik Pharmaceuticals Pvt. Ltd., were the associates of the company.
- . Unique Chemicals was amalgamated with the company.

KALN (2)

- . "During 1987-88, a sum of Rs.109.06 lakhs was spent on a new effluent treatment plant, energy saving devices and for modernisation of the existing plants. During 1990-91, a capital expenditure of Rs.203.51 lakhs was incurred on the new disclophenac sodium project, soft gelatine capsules plant and modernisation of the other existing plants of the company."

(25) GUJARAT LYKA ORGANICS, LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1988-89	20.62	6.01

DMND (3)

- . Distinct groups were identifiable.

MNCS (1)

- . Foreign equity holding was 4.57%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . "In October 1991, commercial production in the 7 ADCA-Cephalexin project commenced."
- . Technical collaboration with (a) Ininter S.A., Switzerland; (b) Gist Brocades, Holland.
- . Consultancy agreement with Pipecon Engineers & contractors.

KALN (1)

- . No information is available on capital allocation.

(26) GUJARAT PETROSYNTHESIS LTD.

PRST (1)

- . The company was producing only one product

MSEL (1)

- . Year Domestic Sales
(Rs. Crores)

1990-91	19.80
---------	-------

- . No information is available on exports.

DMND (1)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 23.51%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D Department
- . Both these departments were used by the existing Polybutene Plant as well as by the Karnataka Plant set up by the Company.

DIV (1)

- . Polybutene Plant was the only product division.

DIVR (2)

- . Collaboration with Cosdesn Technology Inc., U.S.A.
- . "On March 28, 1991, the company took over a sick unit, 'Fur Fur Chemicals Ltd.'
- . The company set up Karnataka Petro Synthese Ltd.

KALN (3)

- . Capital was allocated for the karnataka Company.
- . Capital was allocated for the modernization purpose of the Baroda Plant.

(27) SUDARSHAN CHEMICAL INDUSTRIES LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (1)

- . The company was selling in the domestic market.
- . No information is observable on exports.

DMND (3)

- . Intermediate products were produced.
- . Distinct groups are observable.

MNCS (1)

- . Foreign equity holding was 30.04%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D Department

DIV (3)

- . The company had three factories located in Pune, Roha and Mahad which produced different kinds of products.

DIVR (2)

- . Refer to the statement under DIV.
- . Technical collaboration with (a) Sericol A.G., Switzerland; (b) Sanyo Colour Works, Ltd., Japan; (c) Allied Chemical corporation, U.S.A.

. "Bright Pearl Products, Ltd., is a subsidiary of the Company."

KALN (3)

- . Rs.3.0 crores spent for AZO pigments project in Roha.
- . Capital was allocated for Mahad Plant as well as for the expansion and modernisation programme of Roha Plant.

(28) CHEMINOR DRUGS LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

- . The company was selling both in the domestic market as well as in the international market.

DMND (3)

- . Intermediate products were produced.
- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 7.35%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . The company had three factories located at R.R. district, Srikakulam district and Nalgonda district and produced different kinds of products.

DIVR (3)

- . Refer to the statement under DIV.
- . Hyderabad plant was producing Ibuprofen.
- . A.P. Plant was producing chloramphenicol and Levobase.

KALN (3)

- . Capital was allocated for the A.P. Plant.
- . Capital was allocated for capacity expansion.

(29) TTK PHARMA LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (1)

- | Year | Domestic Sales
(Rs. Crores) |
|---------|--------------------------------|
| 1984-85 | 12.18 |
| 1985-86 | 16.15 |
- . No information is available on exports.

DMND (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 1.23%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D Department

DIV (3)

- . Chemical Division, Indian Medicine Division; Animal Welfare Division; Pharmaceutical Division; Climicare Division.

DIVR (3)

- . Refer to the statement under DIV.
- . In 1974 and 1982 Chemical and Animal Welfare Divisions were

introduced respectively.

- . The company set up a Clinicare Division to deal with blood bags and allied products.

KALN (3)

- . Capital was allocated for each product division from time to time.

(30) CHEMFAB ALKALIS LTD.

PRST (1)

- . Vertically integrated firm.
- . Same kind of technology was used.

MSEL (2)

- . The company was selling in the domestic market.
- . During 1990-91, the company earned foreign exchange equivalent to Rs.9.12 lakhs by exporting manpower.

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 6.09%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Foreign collaboration with Chlorine Engineers Corporation Ltd., Japan.
- . Agreement with unde GmbIt, West Germany.

- . Proposed to set up a joint venture abroad.

KALN (3)

- . Capital was allocated for the capacity expansion of the caustic soda plant.
- . Capital was allocated for the installation of capacitors.

(31) ALBRIGHT MORARJI & PANDIT LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (1)

- . Year Domestic Sales
(Rs. Crores)
- 1989-90 35.50
- 1990-91 29.40
- . No information is observable on exports.

DMND (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 39.93%.
- . Use of foreign brand name ALBRIGHT.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . The company had two separate factories located at Roha and Ambarnath.
- . Sulphuric Acid Plant and Sodium hexametaphos-phate Plant.

DIVR (2)

- . Refer to the statements under DIV.
- . The company set up a project at Ambarnath.
- . "... the company proposed to participate in the joint venture between Albright Metal Finishing Pvt. Ltd. and Albright & Wilson Ltd., U.K...."

KALN (3)

- . Capital was allocated for each plant for the expansion and introduction of new products.
- . Capital was allocated for the modernisation of the Ambarnath Plant.

(32) MAX INDIA LTD.

PRST (1)

- . Only one product was produced.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	46.84	15.77

DMND (1)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Collaboration with (a) Toyo Jozo Co . , Ltd., Tokyo;
- (b) Schering A.G., West Germany; (c) Fortune 200 Co.
- . "During 1989-90, the company's financial-cum-technical joint venture with Bostik Ltd. for its adhesive project...."

KALN (3)

- . Capital was allocated to set up a plant to manufacture 7-ADCA.
- . Capital was allocated for the expansion and modernisation of the existing plant.

(33) VANAVAL DYES & CHEMICALS LTD.

PRST (1)

- . Intermediate products were produced.
- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	21.34	1.38

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 0.28%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Naphthols Plant; First Colour Base Unit; Dye intermediate Project.

DIVR (3)

- . Refer to the statement under DIV.
- . The product range was enhanced through the existing unit.

KALN (3)

- . Rs.140 lakhs spent for an export oriented project.
- . Capital was allocated for the production of First Colour Bases.

(34) AMINES & PLASTICIZERS LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (1)

- . The company was selling in the domestic market.
- . No information is available on exports.

DMND (3)

- . Refer to the statement under PRST.

MNCS (1)

- . Foreign equity holding was 0.06%.
- . No use of foreign brand name.

COMN (2)

- . Common R & D Centre
- . Common Marketing Department

DIV (3)

- . Chemical Plant; APL Industrial Gases Plant.

DIVR (3)

- . Refer to the statement under DIV.
- . In 1980, the company set up a plant at Vadval Village.
- . During 1980, the company set up a commercial plant for the manufacture of Morpholine.

- . During 1988-89, the company agreed to set up a plasticizer plant in Bangladesh.

KALN (3)

- . Captial was allocated for each plant from time to time.

(35) SOL PHARMACEUTICALS LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	20.46	5.17

DMND (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Formulations Unit; Bulk Drugs Units.

DIVR (2)

- . Refer to the statement under DIV.
- . Acquisition of the Pharmaceutical Division of the standard organics, Ltd.
- . "During 1987-88, three companies, viz., SOL Drugs Ltd., Dexo Pharma Pvt., Ltd., and Dakshin Pharmaceuticals, Ltd., were amalgamated

with the company."

KALN (3)

- . Capital was allocated for the expansion and modernisation programme as well as for the launching of new products by each product division from time to time.

(36) ABBOTT LABORATORIES (INDIA) LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (1)

- . The company was selling products in the domestic market.
- . No information is available on exports.

DMND (2)

- . Somewhat products were related.

MNCS (2)

- . Foreign equity holding was 40.01%.
- . Use of foreign brand name ABBOTT.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . Kurla and Ankleshwar factories were producing chemical products and drugs, respectively.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with Abbott Laboratories, U.S.A.
- . The company set up a multi-purpose organic synthesis plant.

KALN (3)

- . Captial was allocated for the production of bulk erythromycin as well as for the synthesis plant.

(37) UDAIPUR PHOSPHATES & FERTILISERS LTD.

PRST (3)

- . Vertically integrated firm.
- . Distinct groups are identifiable.

MSEL (1)

- . The company was selling in the domestic market.
- . No information is available on exports.

DMND (1)

- . The company was producing same kind of acids.

MNCS (1)

- . Foreign equity holding was 14.23%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Superphosphate Plant; Sulphuric Acid Plant.

DIVR (3)

- . Refer to the statement under DIV.
- . During 1988-89, Oleum 65% Plant was commissioned.
- . "During April 1991, the company commissioned the plant to manufacture chlorosulphuric Acid."

KALN (3)

- . Captial was allocated for the expansion and modernisation programme of each plant from time to time.

(38) DUPHAR-INTERFRAN LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	+ ve	0.90

DMND (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 38.86%.
- . Use of foreign brand name DUPHAR.

COMN (2)

- . Common R and D Centre
- . Common Marketing Department

DIV (3)

- . The company had two factories located in Thane and Vapi and produced distinct types of products.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with (a) N.V. Philips-Duphar, Amsterdam and Crookes Laboratories, Ltd., London; (b) N.V. Philips Gloeilampenfabrieken, Holland.
- . The company set up a joint venture in H.P.

KALN (3)

- . Capital was allocated for joint venture.
- . In 1979, the company allocated capital for the Vapi Unit.

(39) CELLULOSE PRODUCTS OF INDIA LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	18.71	0.46

DMND (3)

- . Conglomerate firm.
- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 0.04%.
- . No use of foreign brand name.

COMN (2)

- . Common R and D Department
- . Common Marketing Department

DIV (3)

- . Straw Board Plant; Kathwada Unit; Alcohol Plant; Cotton linters pulp plant; RVA Plant.

DIVR (3)

- . Refer to the statement under DIV.
- . During 1968-69, the company undertook a novel packaging items plant.
- . During 1985-86, the company set up a bio-gas Plant.
- . "In 1975-76, the company jointly with the Bharat Vijay Mills Ltd., promoted a new company...."

KALN (3)

- . Rs.28 lakhs were allocated for the Novel Packaging items Plant.
- . Capital was allocated for capacity expansion of the PVA Plant.
- . Capital was allocated for the expansion and modernisation programme of the Ankleshwar Plant as well as for the Alcohol Distillery Plant.

(40) DIAMINES & CHEMICALS LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1991-92	23.26	1.54

DMND (2)

- . Somewhat products were related to each other.

MNCS (1)

- . Foreign equity holding was 0.05%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Collaboration with (a) M/s. Stoller Chemicals, U.S.A.;
(b) Grace Rexolin, Sweden.
- . "During 1990-91, a company in the name and style of Hindusthan Biotech Ltd. (HBL), was incorporated for setting up the said bulk

drug project."

KALN (2)

- . The company was allocated capital for the modernisation and expansion programme from time to time.

(41) FULFORD (INDIA), LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	47.52	+ ve

DMND (2)

- . Products were somewhat common to each other.

MNCS (2)

- . Foreign equity holding was 40.00%.
- . Use of foreign brand name FULFORD.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Technical collaboration with Schering Corporation, U.S.A.
- . "The company thus, became a wholly owned subsidiary of Schering Corporation, U.S. A., which is a 100% subsidiary of Schering-Plough Corporation, U.S.A.

KALN (3)

- . Capital was allocated for launching ENSAMYCIN cream.

. Captial was allocated for the promotion of new products.

(42) TAMIL NADU DADHA PHARMACEUTICALS LTD.

PRST (3)

. Three different groups of products were identifiable, viz.,
Powders; Ointments, and Bulk drugs.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1988-89	18.17	0.31

DMND (3)

. Refer to the statement under PRST.

MNCS (1)

. Foreign equity holding was 0.01%.

. No use of foreign brand name.

COMN (2)

. Common R and D Department

. Common Marketing Department

DIV (3)

. Bulk drugs Division; Formulation Unit.

DIVR (3)

. Refer to the statement under DIV.

. During 1979-80, the company marketed ULSEEL and ONCOTRON through
the Drug Unit.

. During 1985-86, the formulation unit launched Buprenophine HCL.

KALN (2)

. Rs.300 lakhs were spent for the modernisation and capacity
expansion programme.

(43) J.L. MORISON (INDIA) LTD.

PRST (3)

- . Conglomerate firm.
- . Distinct products are identifiable.

MSEL (2)

- . The company was selling in the domestic market.
- . The company was an exporter of toiletries, pharmaceuticals and chemical products.

DMND (3)

- . Refer to the statements under PRST.

MNCS (2)

- . Foreign equity holding was 40.09%.
- . Use of foreign brand name MORISON.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Bangalore and Bombay factories were producing different kinds of products.

DIVR (2)

- . Refer to the statement under DIV
- . Collaboration with (a) Cupal, U.K; (b) Dermasciences, U.S.A.
- . "Allied chemicals Co. Ltd., a wholly owned subsidiary was amalgamated with the company...."
- . "Smith & Nephew (India) Ltd.,... was amalgamated with the company...."

KALN (2)

- . "During 1990-91, the company had availed a modernisation loan

from KSIDC of about Rs.30 lakhs which was invested in upgrading technology and manufacturing process."

(44) UNICHEM LABORATORIES LTD.

PRST (1)

. Same kind of drugs were produced by using identical technology.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990-91	66.78	14.12

DMND (2)

. Products were somewhat related.

MNCS (1)

. Foreign equity holding was 0.21%.

. No use of foreign brand name.

COMN (2)

. Common Marketing Department

. Common Research Department

DIV (3)

. Unisearch Division; AG Vet Division; Unit number 3 in Roha.

DIVR (2)

. Refer to the statement under DIV.

. Collaboration with (a) Roshkilde Medical Co., Denmark;
(b) Shofu Dental Mfg. Co. Ltd., Japan.

. During 1986-87, Veterinary Division launched its products.

KALN (3)

. Capital was allocated for AG Vet Division.

. Capital was allocated for the modernisation purpose of the

existing three factories.

(45) ALKYL AMINES CHEMICALS LTD.

PRST (1)

- . Only Amines types of products were produced by using the same kind of technology.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1991-92	13.28	0.23

DMND (1)

- . Products were highly substitutable.

MNCS (1)

- . Foreign equity holding was 0.52%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Collaboration with (a) Acid Amines Technologie Inc. U.S.A.;
(b) Leonard Process Co. Inc., U.S.A.
- . The single product division launched new products, viz., Corrosion inhibitors, Isopropylamine, and so on.

KALN (3)

- . "During 1989-90, the company incurred an expenditure of Rs.152 lakhs to debottleneck ethylamines production."
- . "The company undertook to put up a new amines plant...."

(46) MILES INDIA LTD.

PRST (2)

- . Somewhat common technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1988-89	3.85	0.22

DMND (2)

- . To some extent products were substitutable.

MNCS (2)

- . Foreign equity holding was 40.11%.
- . Use of foreign brand name MILES.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Collaboration with Miles Laboratories Inc., U.S.A.

KALN (2)

- . Capital was allocated for the Electro-medical instruments.
- . The company allocated capital for the modernisation programme as well as for sales promotion programme.

(47) CORE PARENTERALS, LTD.

PRST (1)

- . Single product firm.

MSEL (2)

Year	Domestic Sales	Exports
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	(Rs. Crores)	(Rs. Crores)
1990-91	13.29	6.65
DMND (1)		
. Refer to the statement under PRST.		
MNCS (1)		
. Foreign equity holding was 2.24%.		
. No use of foreign brand name.		
COMN (1)		
. Refer to the statement under DIV.		
DIV (1)		
. No separate product division is observable.		
DIVR (1)		
. No new product was launched.		
KALN (2)		
. "The total cost of the expansion project was estimated at Rs.3,700 lakhs...."		
(48) MONSANTO CHEMICALS OF INDIA LTD.		
PRST (1)		
. Single product firm.		
MSEL (1)		
. The company was selling only in the domestic market.		
DMND (1)		
. Refer to the statement under PRST.		
MNCS (2)		
. Foreign equity holding was 40.07%.		
. Use of foreign brand name MONSANTO.		

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (1)

- . No new product was launched.

KALN (3)

- . Capital was allocated for manufacturing locally, heat transfer fluids and poultry feed supplements.

(49) SADHANA NITRO CHEM LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	13.56	6.58

DMND (2)

- . To some extent products were substitutable.

MNCS (1)

- . Foreign equity holding was 0.02%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate prouduct division is observable.

DIVR (1)

- . No new prouduct was launched.

KALN (3)

- . "In 1985-86, plant and machinery was installed to recover a product from effluent...."
- . "Steps were also taken to expand the existing dye intermediate plants."

DATA FOR THE CHEMICAL INDUSTRY

SL.NO.	NAME OF THE COMPANY	CVSI	CVVI	DUMY	PRST
1.	HINDUSTAN LEVER, LTD.	24.2373	11.4896	1	3
2.	GUJARAT NARMADA VAL.FER.LTD.	16.1209	23.5719	1	3
3.	DEEPAK FER.& PETRO.CORPN.LTD.	09.1555	31.1473	0	1
4.	TAMILNADU PETROPRODUCTS,LTD.	31.2297	18.0602	0	3
5.	ICI INDIA, LTD.	21.7509	29.7922	1	3
6.	NATIONAL ORG.CHEM IND.,LTD.	22.2198	07.8089	1	2
7.	POLYOLEFINS IND.,LTD.	22.3142	15.4743	1	2
8.	MODI ALKALIES & CHEM.,LTD.	41.2212	19.6982	1	1
9.	FINOLEX PIPES, LTD.	30.2281	44.5448	1	1
10.	R.& C. OF INDIA LTD.	27.4424	08.3725	1	3
11.	RAMA PETROCHEMICALS LTD.	05.3412	11.7219	0	1
12.	HOECHST INDIA, LTD.	14.9652	23.1161	1	2
13.	E.MERCK (INDIA),LTD.	27.3214	06.4291	1	2
14.	BOOTS PHARMACEUTICALS LTD.	19.4543	15.8429	1	2
15.	SANDOZ (INDIA),LTD.	25.2606	14.2169	1	3
16.	COLOUR-CHEM,LTD.	20.1521	16.2234	1	1
17.	BLUE BLENDS PETROCHEM.,LTD.	75.5807	84.7654	0	1
18.	IDL CHEMICALS,LTD.	11.8479	13.5957	1	1
19.	BURROUGHS WELL.(INDIA),LTD.	23.1576	22.9676	1	2
20.	CYANAMID INDIA,LTD.	23.0241	07.8098	1	2
21.	ROCHE PRODUCTS,LTD.	18.5276	06.0526	1	3
22.	SHREE ACIDS & CHEM.LTD.	13.9621	29.3817	0	3
23.	ALEMBIC CHEM.WORKS CO.,LTD.	24.1450	14.9287	1	3
24.	J.B.CHEM & PHARMA.,LTD.	27.9070	14.1419	1	1
25.	GUJARAT LYKA ORGANICS,LTD.	17.8817	10.4325	0	1
26.	GUJARAT PETROSYNTHESIS LTD.	18.9344	38.2363	0	1
27.	SUDARSHAN CHEM. IND.,LTD.	33.1649	10.2989	1	1

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL.NO.	NAME OF THE COMPANY	CVSI	CVVI	DUMY	PRST
28.	CHEMINOR DRUGS LTD.	58.3936	33.3788	0	1
29.	TTK PHARMA LTD.	45.4847	21.7756	1	2
30.	CHEMFAB ALKALIS LTD.	36.6217	23.7574	0	1
31.	ALBRIGHT M & S.P.,LTD.	33.5509	25.4459	1	2
32.	MAX INDIA LTD.	48.7795	25.4247	0	1
33.	VANAVIL DYES & CHEM.LTD.	34.9383	22.9999	1	1
34.	AMINES & PLASTICIZERS LTD.	06.8395	33.4922	1	3
35.	SOL PHARMACEUTICALS LTD.	41.5175	35.0219	0	2
36.	ABBOT LABS.(INDIA)LTD.	07.5479	04.4845	1	2
37.	UDAIPUR PHOS. & FER. LTD.	20.5255	45.8545	0	3
38.	DUPHAR INTERFRAN LTD.	25.6250	15.3241	1	3
39.	CELLULOSE PORD. OF INDIA LTD.	20.2752	15.7611	1	3
40.	DIAMINES & CHEMICALS LTD.	27.2521	13.8231	1	1
41.	FULFORD (INDIA) LTD.	26.5317	41.3816	1	2
42.	TAMILNADU DPOHA PHARLS.LTD.	16.4445	21.3848	1	3
43.	J.L.MORISON (INDIA) LTD.	27.5851	11.0207	1	3
44.	UNICHEM LABORATORIES LTD.	28.7403	10.2224	1	1
45.	ALKYL AMINES CHEMICALS LTD.	28.0591	12.9978	1	1
46.	MILES INDIA LTD.	40.0115	16.3509	1	2
47.	CORE PARENTERALS,LTD.	62.9072	16.2334	0	1
48.	MONSANTO CHEM OF INDIA LTD.	21.1488	20.9519	0	1
49.	SADHANA NITRO CHEM. LTD.	35.1285	37.0675	1	3

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL. NO.	MSEL	DMND	MNCS	COMN	DIV	DIVR	KALN	WAGE
1.	2	3	2	2	3	2	3	05.0718
2.	1	3	1	2	3	2	3	08.4486
3.	1	1	1	1	1	2	2	08.8375
4.	2	3	1	2	3	2	3	02.7465
5.	2	3	2	2	3	2	3	11.0888
6.	2	2	1	2	3	2	3	06.7099
7.	2	2	1	2	3	2	3	08.7361
8.	2	2	1	2	3	3	3	06.2309
9.	2	1	1	1	1	2	3	01.3746
10.	2	3	2	2	3	2	3	15.5251
11.	1	1	1	1	1	2	3	03.5411
12.	2	3	2	2	3	2	3	11.3110
13.	2	2	2	2	3	2	3	18.9486
14.	2	2	2	2	3	2	3	22.8479
15.	2	3	2	2	3	2	3	12.4184
16.	2	3	1	2	3	2	3	10.7969
17.	1	1	1	2	3	2	2	01.5448
18.	1	2	2	2	3	2	3	29.2329
19.	2	2	2	2	3	3	3	16.1322
20.	2	3	2	2	3	3	3	23.0755
21.	2	3	2	2	3	3	3	24.4193
22.	1	3	1	2	3	2	3	05.0002
23.	2	3	1	2	3	2	3	11.9985
24.	2	2	1	2	3	2	2	07.9180
25.	2	3	1	1	1	2	1	01.5974
26.	1	1	1	2	1	2	3	04.5464
27.	1	3	1	2	3	2	3	08.8742

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL. NO.	MSEL	DMND	MNCS	COMN	DIV	DIVR	KALN	WAGE
28.	2	3	1	2	3	3	3	02.4310
29.	1	3	1	2	3	3	3	11.6899
30.	2	3	1	1	1	2	3	04.9428
31.	1	3	2	2	3	2	3	10.4349
32.	2	1	1	1	1	2	3	03.6304
33.	2	3	1	2	3	3	3	03.5229
34.	1	3	1	2	3	3	3	09.6969
35.	2	3	1	2	3	2	3	10.7019
36.	1	2	2	2	3	2	3	16.7540
37.	1	1	1	2	3	3	3	05.6154
38.	2	3	2	2	3	2	3	16.6659
39.	2	3	1	2	3	3	3	16.1131
40.	2	2	1	1	1	2	2	07.4701
41.	2	2	2	1	1	2	3	08.0787
42.	2	3	1	2	3	3	2	09.8379
43.	2	3	2	2	3	2	2	17.8654
44.	2	2	1	2	3	2	3	19.1640
45.	2	1	1	1	1	2	3	11.2692
46.	2	2	2	1	1	2	2	12.5338
47.	2	1	1	1	1	1	2	11.1993
48.	1	1	2	1	1	1	3	08.1837
49.	2	2	1	1	1	1	3	05.4016

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL. NO.	LQID	DEBT	EQTY	ASET	GRTH	VRTI
1.	01.2140	01.6742	00.01	6.2360	0.4508	26.6991
2.	01.3500	02.7654	00.00	7.2716	0.5183	38.3355
3.	03.3480	03.3370	00.75	2.1727	1.3944	23.7714
4.	01.6400	02.7777	00.02	2.4917	0.2865	18.4568
5.	01.1275	01.9934	00.01	4.9594	0.2717	24.5808
6.	01.4860	01.4400	00.22	3.4717	0.7389	18.1930
7.	01.1380	01.7451	00.15	2.0149	0.8638	13.4973
8.	01.8160	02.5849	00.09	0.5580	0.6165	12.4291
9.	03.1140	04.1883	05.51	1.2654	1.7514	13.1367
10.	01.6800	00.8189	00.14	0.4982	0.7841	16.8303
11.	03.8133	02.6611	04.06	0.7417	0.1096	16.2935
12.	01.1780	01.4356	00.00	1.9691	0.6591	20.2869
13.	01.1775	02.9823	02.76	0.5219	0.8739	25.7269
14.	01.6760	01.2106	00.08	0.4413	0.6434	20.3401
15.	01.4580	02.1209	00.04	0.9494	0.4697	22.6143
16.	01.2460	02.9001	00.25	0.9191	0.5944	27.1168
17.	05.9150	02.1105	00.10	0.2386	0.2459	31.0377
18.	01.3000	01.2564	01.24	0.6099	0.3237	17.8046
19.	01.6150	01.5508	00.01	0.4348	0.5015	23.7967
20.	01.8420	01.1484	00.13	0.3463	0.5928	25.2809
21.	01.5920	01.4970	00.00	0.2719	0.3936	19.0643
22.	01.3000	03.3678	06.51	0.2433	0.7622	23.8958
23.	01.1820	02.3754	13.16	0.6866	0.4582	22.0650
24.	01.4200	01.5999	41.71	0.2852	0.5315	11.7415

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL. NO.	LQID	DEBT	EQTY	ASET	GRTH	VRTI
25.	01.1100	04.5477	06.85	0.2343	0.7720	16.3126
26.	02.3780	00.8386	17.05	0.1317	0.3058	11.7001
27.	01.4480	02.2284	15.46	0.5399	0.7926	23.0853
28.	01.2680	04.3088	14.62	0.1789	1.5164	30.2029
29.	01.3840	02.0631	33.80	0.1934	0.6993	17.2495
30.	01.9660	01.6355	03.75	0.1239	0.4041	11.8482
31.	01.9040	01.1733	03.18	0.1216	0.6610	19.8146
32.	01.0800	04.9892	02.21	0.2242	1.0033	23.8951
33.	01.5050	03.4580	00.04	0.1103	0.6894	17.2664
34.	01.3525	03.3701	02.66	0.1468	0.4454	15.2129
35.	01.2080	06.3684	02.07	0.1428	1.3302	25.6417
36.	01.2650	02.7373	00.01	0.1949	0.0626	24.8260
37.	01.2500	02.6897	07.42	0.1036	0.9373	13.5008
38.	01.0880	02.9210	37.23	0.2009	0.7389	24.8223
39.	01.3580	01.1088	21.44	0.1936	0.3552	20.9533
40.	01.1100	04.0648	00.30	0.1487	0.4508	31.2483
41.	01.2060	04.0493	00.28	0.2505	0.5349	21.8923
42.	01.2075	03.3162	13.69	0.1744	0.6515	34.1972
43.	01.4020	02.4307	00.04	0.1004	0.6351	21.4503
44.	01.0775	01.4496	26.74	0.2649	0.4343	12.8973
45.	01.1175	03.9520	12.64	0.1211	0.8892	32.4692
46.	01.4220	01.6247	16.69	0.0579	0.9268	24.6169
47.	01.1933	03.9541	04.45	0.1432	1.2087	30.9577
48.	01.7375	01.4599	05.40	0.0449	0.5943	54.5642
49.	01.3020	02.3133	15.18	0.0594	0.5263	09.6010

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL.NO.	CAPA	SALE	SHPT	LOPA	LOPT
1.	130.7325	12.6627	04.7905	09.6301	25.7415
2.	040.8803	03.1548	03.4899	01.6264	06.0643
3.	107.7200	00.4183	23.4859	05.1376	21.0964
4.	092.4280	02.1102	07.5162	06.1819	22.8972
5.	052.6889	06.3813	02.2379	02.9705	09.0294
6.	092.6855	04.5701	07.9457	09.9605	24.2534
7.	072.0317	02.3278	07.8351	09.5429	25.6225
8.	087.9005	00.4555	04.8979	03.7732	12.1284
9.	074.3755	00.7408	07.6332	07.2939	28.2848
10.	064.9530	00.8773	09.1129	16.0637	29.1593
11.	106.2680	00.4355	11.1261	08.8472	31.8760
12.	040.2778	02.5125	01.9788	02.5378	06.6485
13.	092.5779	00.6067	03.6757	04.4609	16.8574
14.	069.5059	00.7867	06.0984	10.9871	24.2142
15.	041.3562	01.6429	02.1553	03.7828	11.7016
16.	064.8919	01.2034	02.9975	03.9404	15.3497
17.	010.1170	00.0829	17.8605	04.7928	15.2011
18.	040.0329	00.5403	06.2943	05.6975	12.6683
19.	013.8996	00.8226	02.9622	07.0483	13.8402
20.	054.3369	00.5808	03.9456	06.5093	13.5885
21.	038.8205	00.4843	01.7979	03.0818	07.1208
22.	090.4096	00.3072	05.0730	06.2476	20.1238
23.	051.3765	01.0284	01.4942	02.1882	07.2563
24.	089.2629	00.4689	07.3448	12.3496	28.1241

CONTD.

DATA FOR THE CHEMICAL INDUSTRY

SL.NO.	CAPA	SALE	SHPT	LOPA	LOPT
25.	044.1420	00.2841	01.8673	02.3031	14.3816
26.	091.1200	00.1632	10.9005	13.4292	24.3930
27.	056.8589	00.6677	04.2168	05.2224	16.6055
28.	080.0000	00.1998	07.5320	09.2009	39.2269
29.	087.2513	00.2804	04.0754	04.3071	12.8289
30.	081.3432	00.1077	10.9406	09.4513	23.2094
31.	043.4653	00.2342	06.7349	12.7934	26.6897
32.	043.0769	00.2978	05.9357	07.5416	35.4306
33.	040.8421	00.1499	05.1542	06.5806	29.0878
34.	071.8331	00.1904	02.1379	02.7245	12.0277
35.	054.7638	00.1721	04.2787	05.4075	39.1808
36.	072.6747	00.3429	01.4315	02.5821	09.5745
37.	096.0023	00.1683	04.2389	06.9645	24.5149
38.	038.6442	00.2898	02.7419	04.0092	15.8507
39.	047.9179	00.1613	01.4082	01.2221	02.7108
40.	064.9275	00.1651	04.5253	05.0912	24.9715
41.	104.4202	00.3922	02.3910	03.5565	18.1794
42.	083.7479	00.2328	03.3219	04.4897	17.2215
43.	036.8352	00.2071	02.3846	03.5883	15.1929
44.	060.9927	00.5269	01.8356	03.3908	08.9585
45.	068.2500	00.1001	11.6765	10.4545	44.1984
46.	051.7144	00.0686	10.4503	12.3296	31.3234
47.	00.5557	00.0718	12.0258	06.0135	31.4962
48.	048.5185	00.0508	04.0072	04.5672	11.0972
49.	048.5821	00.1066	04.1819	07.6261	24.5043

Notes :

SL.NO.	NAME OF THE COMPANY	YEARS
4.	TAMILNADU PETROPRODUCTS,LTD.	1988; 1990; 1991; 1992
5.	ICI INDIA, LTD.	1987; 1989;1991; 1992
11.	RAMA PETROCHEMICALS LTD.	1989; 1990; 1991
13.	E.MERCK (INDIA),LTD.	1987; 1988; 1989; 1990
17.	BLUE BLENDS PETROCHEM.,LTD.	1990; 1991
18.	IDL CHEMICALS,LTD.	1987; 1988; 1989; 1990
19.	BURROUGHS WELL.(INDIA),LTD.	1987; 1989; 1990; 1991
22.	SHREE ACIDS & CHEM.LTD.	1988; 1989; 1990; 1991
25.	GUJARAT LYKA ORGANICS,LTD.	1989; 1990; 1991; 1992
33.	VANAVIL DYES & CHEM.LTD.	1987; 1989; 1990; 1991
34.	AMINES & PLASTICIZERS LTD.	1987; 1989; 1990; 1991
36.	ABBOT LABS.(INDIA)LTD.	1989; 1990; 1991; 1992
42.	TAMILNADU DPDHA PHARLS.LTD.	1987; 1988; 1989; 1990
44.	UNICHEM LABORATORIES LTD.	1986; 1987; 1989; 1991
45.	ALKYL AMINES CHEMICALS LTD.	1986; 1989; 1990; 1991
47.	CORE PARENTERALS,LTD.	1989; 1990; 1991
48.	MONSANTO CHEM OF INDIA LTD.	1987; 1989; 1990; 1991

COTTON TEXTILE INDUSTRY

(1) JCT, LTD.

PRST (2)

. Manufacturing processes were somewhat related across divisions.

MSEL (2)

Year	Turnover (Rs.Crores)	Export (Rs.Crores)
1982-83	118.58	5.40
1988-90	278.00	14.12

DMND (3)

. Distinct products are identifiable.

MNCS (1)

. Foreign equity holding data are not available.

. No use of foreign brand name.

COMN (3)

. Common Marketing Department

DIV (3)

. Phagwara Unit; Sriganaganagar Unit; Hoshiarpur Unit.

. All the above mentioned units were producing different products.

DIVR (2)

. Diversification into different products e.g., blended fabrics, etc., was started through different production units by the company.

. Tapan Synthetics, Ltd., was merged with the company in 1979.

. During 1962-63, the company acquired Benaras Cotton and Silk mills.

. Gupta and Syal, Ltd., became a wholly owned subsidiary of the company.

. During 1973-74, the company entered into a collaboration

agreement with Thonburi Textiles Mills, Ltd., Bangkok.

KALN (3)

- . Rs.2 crores was allocated for purchasing generator and machines for Phagwara Unit.
- . The company allocated capital to have New Super Spinner Frames at Sriganganagar Unit.

(2) KHATAU MAKANJI SPG. AND WVG. CO., LTD.

PRST (2)

- . Products were somewhat related.

MSEL (1)

- . Products were sold only in the domestic market.
- . No information is observable on exports.

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Khatau Dyes and Fibres Ltd., and Fashion Prints Ltd., were wholly owned subsidiaries of the company.

KALN (2)

- . During 1978-80, Rs.100 lakhs spent towards modernisation programme of the company.

Capital was allocated for Mahad project.

(3) RAJASTHAN.SPG. & WVG. MILLS, LTD.

PRST (2)

. Manufacturing processes were somewhat related across divisions.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs.Crores)
1989-90	+ ve	6.39

DMND (2)

. Products were somewhat substitutable.

MNCS (1)

. Foreign equity holding data are not available.

. No use of foreign brand name.

COMN (2)

. Common Foreign Contract Division

. Common Marketing Division

DIV (2)

. Kharigram Mill; Lodhar Mill; Bhilwara Mill.

. Foreign contract Division.

DIVR (2)

. Bhilwara Spinners Limited was a subsidiary of the company.

. Collaboration with Zwicky and Co., Switzerland.

. During 1972-73, the company undertook to establish a new unit at Kharigram.

KALN (2)

Rs.9.46 and Rs.1.79 were allocated for Bhilwara and Kharigram units respectively.

During 1987-89, Rs.7.75 allocated for the modernisation

programme.

(4) BHARAT VIJAY MILLS, Ltd.

PRST (1)

. Products were highly related across divisions.

MSEL (2)

. The company was selling products in the domestic market.

. Textile Division exported its products.

DMND (1)

. Market-wise products were mostly substitutable.

MNCS (1)

. Foreign equity holding was 0.03% .

. No use of foreign brand name.

COMN (2)

. Common Marketing Division

DIV (3)

. Textile Division; Plastic Division; BVM Threads Division;
Chemical Division.

DIVR (2)

BVM Polyester and Chemicals Ltd., became a wholly owned subsidiary of the company in 1980.

The company acquired The New Commercial Mills Co., Ltd.

Collaboration with Chemiques Ugine Kuhlmann, France.

Collaboration with Cousin Freres, France.

KALN (3)

Rs.100 lakhs was allocated for the modernisation programme of the Textile Division.

Rs.450 lakhs was allocated for the BVM Threads Division.

Capital was allocated for the Chemical Division.

(5) JUGGILAL KAMLAPAT COTTON SPG. AND WVG. MILLS CO., LTD.

PRST (3)

- . Distinct groups are identifiable across divisions.

MSEL (2)

- . The company was selling its products in the domestic market.
- . During 1989-90, the company exported fabrics valued at Rs.8.33 lakhs.

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . No information is observable.

DIV (3)

- . Textile Division; Rayon Plant; J.K.Electronics Plant.

DIVR (2)

- . In 1967, the company implemented a T.V., project at Kanpur, under the name J.K Electronics.
- . "During 1986, the company entered into an agreement with the Pradeshia Industrial Investment Corporation of U.P. Ltd. (PICUP) for undertaking a photo film project...."

KALN (3)

Capital was allocated for the modernisation programmes of the Textile Division and Electronics Division.

Rs.225 crores was allocated for the Photo Film project.

(6) SIMPLEX MILLS CO.,LTD.

PRST (3)

- . The company was vertically integrated and technologically products were distinct across plants.

MSEL (2)

Year	Turnover (Rs.Crores)	Exports (Rs.Crores)
1991-92	+ ve	1.77

DMND (2)

- . Market-wise products were somewhat related.

MNCS (1)

- . Foreign equity holding was 0.18%.
- . No use of foreign brand name.

COMN (1)

- . No information is observable.

DIV (3)

- . Bombay Textile Mills; Akola Textile Mills; Paper Plant.

DIVR (2)

Akola unit launched nylon conveyor belting and nylon cycle cordwore.

Gundia Paper Plant introduced special quality of papers.

KALN (3)

"... Rs.6.54 crores for modernising the Bombay unit...."

"...the Company undertook to install balancing equipment in order to increase production, at an estimated cost of Rs.4 crores."

"...the Company undertook to install a high efficiency fluidised bed combustion boiler."

(7) PIRAMAL SPG. AND WVG. MILLS, LTD.

PRST (2)

- . Products were somewhat related.

MSEL (2)

Year	Turnover (Rs.Crores)	Exports (Rs.Crores)
1989-90	46.17	1.30

DMND (2)

- . Market-wise products were somewhat related.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (1)

- . No information is observable.

DIV (1)

- . Bombay Mill and Ambarnath Mill.
- . Both Mills were producing same kind of products.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital was allocated for the modernisation programme from time to time.

(8) SHRI ARBUDA MILLS, LTD.

PRST (2)

- . Products were somewhat related.

MSEL (1)

Product were available in the domestic market.

No information is available on exports.

DMND (2)

- . Market-wise products were somewhat related.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital was allocated for the modernisation programme from time to time.

(9) ARUNA MILLS, LTD.

PRST (2)

- . The company was partially vertically integrated.
- . Products were somewhat related.

MSEL (2)

Year	Turnover	Exports
	(Rs.Crores)	(Rs.Crores)
1990-91	27.5	3.60

DMND (2)

- . Products were somewhat substitutable.

MNCS (1)

Foreign equity holding data are not available.
No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital was allocated for the modernisation programme from time to time.

(10) THE ASHOKA MILLS, LTD.

PRST (3)

- . The company was fully vertically integrated.
- . Distinct groups are identifiable.

MSEL (1)

- . Products were available in the domestic market.
- . No information is available on exports.

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Division

DIV (3)

- . Cotton Textile Division; Silk Division.

DIVR (2)

- . Silk Division was established.
- . "In 1969, Artex Pvt.Ltd., a wholly owned subsidiary of the

Company...., was amalgamated with the Company"

KALN (2)

- . Capital was allocated for the Textile Division and Silk Division from time to time.

(11) THE MANEKLAL HARILAL MILLS, LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products.

MSEL (1)

- . The company was selling products in the domestic market.
- . No information is available on exports.

DMND (2)

- . Somewhat products were substitutable.

MNCS (1)

- . Foreign equity data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (1)

- . Saraspur Mill and Mithipur Mill.
- . Both units were producing same kind of products.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital was allocated for the modernisation programme of the mills.

(12) VICTORIA MILLS, LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products.
- . To some extent the company was vertically integrated.

MSEL (2)

Year	Turnover (Rs.Crores)	Exports (Rs.Crores)
1985	+ ve	4.79

DMND (2)

- . Products were somewhat substitutable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . The company had only one unit in Bombay.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital was allocated for the modernisation programme from time to time.

(13) AHMEDABAD NEW COTTON MILLS CO., LTD.

PRST (3)

- . The company was fully vertically integrated.
- . Distinct groups are identifiable.

MSEL (1)

Year	Turnover (Rs. Crores)
1981	18.23
1983	23.19

DMND (3)

- . Distinct groups are identifiable e.g., bleaching; dyeing; final cotton textile goods.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statements under DIV.

DIV (1)

- . Products are produced in one factory.
- . No separate product division is observable.

DIVR (1)

- . No new product was launched.

KALN (2)

- . Capital allocated for the modernisation programme of the unit from time to time.
- . " During 1985,..., the company privately placed with UTI 50,000-15% secured non-convertible... debentures...."

(14) NUTAN MILLS, LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products.

MSEL (2)

Year	Turnover (Rs.Lakhs)	Exports (Rs.Lakhs)
1988-90	+ ve	79.32

DMND (2)

. Products were somewhat substitutable.

MNCS (1)

. Foreign equity holding data are not available.

. No use of foreign brand name.

COMN (1)

. Refer to the statement under DIV.

DIV (1)

. No separate product division is observable.

DIVR (1)

. In 1982, product mix changed but within the same unit.

KALN (2)

. Capital was allocated for the modernisation programme of the whole company.

. "In 1985,....,the company issued 15% secured non-convertible redeemable debentures at Rs.1.5 crores...."

(15) SARASPUR MILLS, LTD.

PRST (1)

. The company was producing only one product.

MSEL (1)

. The company was selling product in the domestic market.

. No information is available on export.

DMND (1)

. Only one product was produced.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . "Sakriya Investments Ltd., is a wholly owned subsidiary of the company."
- . "In 1982,... suitable changes in the product mix."

KALN (2)

- . Capital was allocated for the modernisation programme of the Sarespur unit.
- . "In 1985,.... the company issued... non-convertible debentures...."

(16) THE DHANALAKSHMI MILLS, LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products across divisions.

MSEL (2)

Year	Turnover	Exports
	(Rs.Crores)	(Rs.Crores)
1989-90	18.21	3.36

DMND (2)

- . Products were somewhat substitutable market-wise.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Trading Department

DIV (3)

- . Jarn and cloth were produced in the Sundaram Road Factory.
- . Knitting and Bleaching were done in the Mettupalayam Factory.

DIVR (3)

- . Refer to the statements under DIV.
- . Changes in product mix are observable.

KALN (2)

- . "During 1990-91, the company undertook a project to implement modernisation-cum-rehabilitation scheme at an estimated cost of Rs.646.00 lakhs with term loan assistance from IRBI, IDBI, ICICI and SBI and Interest Free Sales Tax loan from State Government."

(17) JAM SHRI RANJITSINGHJI SPG. AND WVG. MILLS CO., LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products.
- . To some extent the company was vertically integrated.

MSEL (2)

. Year	Turnover	Exports
	(Rs.Crores)	(Rs.Crores)
1990-91	+ ve	11.44

DMND (2)

- . Market-wise products were somewhat substitutable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (3)

- . Common Marketing Department

DIV (3)

- . Cotton textile Mill; Dyeing, Calendering and Yarn Dyeing Mills.

DIVR (3)

- . Changes in product mix through divisionalisation are observable.
- . The company introduced synthetic blended fabrics.

KALN (2)

- . "During 1989-90, one Laxal Reiter crystalline card was acquired under the modernisation scheme."
- . "The company undertook second scheme of modernisation ... at an estimated cost of Rs.225 lakhs."

(18) SRI VENKATESA MILLS LTD.

PRST (2)

- . Products were somewhat related across divisions.

MSEL (1)

- . The company was selling products in the domestic market.
- . No information is available on exports.

DMND (2)

- . Somewhat related.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Cotton textile goods were produced in the Madras mill.
- . Processing unit in Tamil Nadu.

DIVR (1)

- . No new product was introduced.

KALN (3)

- . "A modernisation scheme was taken up in the spinning and preparatory departments at a total cost of Rs.120 lakhs which was completed in 1984."
- . Capital was allocated for the modernisation programme of the Madras branch mills.

(19) MORARJEE GOCULDAS SPG. & WVG. CO., LTD.

PRST (2)

- . Products were somewhat related across divisions.

MSEL (2)

. Year	Turnover	Exports
	(Rs.Crores)	(Rs.Crores)
1988-89	+ ve	4.62
1990-91	192.00	+ ve

DMND (2)

- . To some extent products were substitutable.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Trading Department
- . Common Marketing Department

DIV (3)

- . Bombay Cotton Textile Mills.
- . Pharmaceutical Division.
- . Piramal Organic Chemical Division.

DIVR (2)

- . "Piramal Exports Ltd., and Elphin Investments Ltd., are also subsidiaries of the Company."
- . "PMP Auto Industries, Ltd., wholly owned subsidiary of... The Morarjee Goculdas Spinning & weaving Co., Ltd."
- . The company launched garment products.

KALN (3)

- . "During 1982-83, the company spent an amount of Rs.217 lakhs on modernisation."
- . "...the company purchased the assets of pharmaceutical division of Kemp & Co. Ltd."
- . "In November 1980, the company purchased the assets of the chemical division of Urvi Investments Ltd.,...."

(20) MAHESHWARI MILLS, LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products across divisions.

MSEL (2)

. Year	Turnover (Rs.Crores)	Exports (Rs.Crores)
1982-83	22.27	4.07
1986-87	23.36	4.23

DMND (2)

- . Somewhat related.
- . The company was partially integrated.

MNCS (1)

- . Foreign equity holding data are not available.
- . No use of foreign brand name.

COMN (2)

- . Common Trading Department
- . Common Marketing Department

DIV (3)

- . Weaving Department; Spinning Department.

DIVR (1)

- . No new product was introduced.

KALN (3)

- . "In 1979-80, the company received loans aggregating Rs.180 lakhs from IDBI, IFCI and ICICI for its second phase modernisation programme."
- . "In 1981-82, the company undertook a programme to modernise the weaving department...."
- . "During 1988-89, the company proposed to modernise the spinning department.... An amount of Rs.142.56 lakhs was spent on modernisation during the year."

(21) AHMEDABAD KAISER-I-HIND MILLS CO., LTD.

PRST (2)

- . Somewhat common technology and inputs were used to produce the products.

MSEL (1)

Year	Turnover (Rs. Crores)
1990-91	08.09

DMND (2)

- Products were somewhat substitutable and complementary to each other.

MNCS (1)

- Foreign equity holding data are not available.
- No use of foreign brand name.

COMN (1)

- Refer to the statement under DIV.

DIV (1)

- No separate product division is observable.

DIVR (1)

- No new product was launched.

KALN (2)

- "During 1988-89, IDBI sanctioned a term loan of Rs.70 lakhs for the purchase of new machines. In addition, GSFC sanctioned a term loan of Rs.6.73 lakhs for the purchase of one DG set of 380 KVA."

DATA FOR THE COTTON TEXTILE INDUSTRY

SL.NO.	NAME OF THE COMPANY	CVSI	CVVI	DUMY	PRST
1.	JCT,LTD.	30.9477	12.7076	1	2
2.	KHATAU MAK.SPG.& WVG.CO.,LTD.	12.0489	20.4228	1	2
3.	RAJASTHAN SPG.& WVG.MIL.,LTD.	15.5652	25.0303	1	2
4.	BHARAT VIJAY MILLS,LTD.	19.4408	12.8781	1	1
5.	J.K.COT.SPG. & WV.MIL.CO.,LTD.	05.4010	04.0139	1	3
6.	SIMPLEX MILLS CO.,LTD.	18.6849	12.4728	1	3
7.	PIRAMAL SPG & WVG. MILLS,LTD.	29.8598	18.3299	1	2
8.	SHRI ARBUDA MILLS,LTD.	03.9083	12.5737	1	2
9.	ARUNA MILLS,LTD.	03.3502	01.9925	1	2
10.	THE ASHOKA MILLS,LTD.	01.9908	10.2288	1	3
11.	MANEKLAL HARILAL MILLS.LTD.	11.4351	04.0513	1	2
12.	VICTORIA MILLS,LTD.	16.0284	15.8579	1	2
13.	AHEMEDABAD NEW CT.ML.CO.,LTD.	03.6285	00.3806	1	3
14.	NUTAN MILLS,LTD.	00.8099	06.5579	1	2
15.	SARASPUR MILLS,LTD.	00.2407	03.2687	1	1
16.	THE DHANALAKSHMI MILLS,LTD.	23.4081	02.6942	1	2
17.	J.S.R.SPG.& WVG.MILLS CO.,LTD.	19.7881	28.0675	1	2
18.	SRI VENKATESA MILLS,LTD.	22.8458	16.0208	1	2
19.	M.G.SPG.& WVG. CO.,LTD.	29.1863	30.1882	1	2
20.	MAHESHWARI MILLS,LTD.	01.4554	05.1628	1	2
21.	AHMEDABAD K.I. MILLS CO.,LTD.	14.7239	26.8529	1	2

CONTD.

DATA FOR THE COTTON TEXTILE INDUSTRY

SL.NO.	MSEL	DMND	MNCS	COMN	DIV	DIVR	KALN	WAGE
1.	2	3	1	3	3	2	3	11.1572
2.	1	3	1	1	1	2	2	12.1366
3.	2	2	1	2	2	2	2	06.2003
4.	2	1	1	2	3	2	3	12.6523
5.	2	3	1	1	3	2	3	33.3185
6.	2	2	1	1	3	2	3	16.2859
7.	2	2	1	1	1	1	2	17.0604
8.	1	2	1	1	1	1	2	19.9161
9.	2	2	1	1	1	1	2	16.0971
10.	1	3	1	2	3	2	2	19.2837
11.	1	2	1	2	1	1	2	13.4946
12.	2	2	1	1	1	1	2	33.4325
13.	1	3	1	1	1	1	2	23.0455
14.	2	2	1	1	1	1	2	19.3538
15.	1	1	1	1	1	2	2	21.6267
16.	2	2	1	2	3	3	2	24.6879
17.	2	2	1	3	3	3	2	11.7328
18.	1	2	1	2	3	1	3	22.4889
19.	2	2	1	2	3	2	3	20.2658
20.	2	2	1	2	3	1	3	16.9701
21.	1	2	1	1	1	1	2	25.0487

CONTD.

DATA FOR THE COTTON TEXTILE INDUSTRY

SL.NO.	LQID	DEBT	EQTY	ASET	GRTH	VRTI
1.	1.0160	1.9552	N.A.	1.9989	0.7613	21.5651
2.	1.0100	3.6279	N.A.	0.6665	0.1441	15.4138
3.	1.3760	1.5578	N.A.	0.6235	0.2564	15.9942
4.	1.3467	2.4286	21.26	0.5871	0.4167	20.3799
5.	1.2600	1.7689	N.A.	0.7625	0.1693	23.7780
6.	1.2220	4.3445	05.52	0.3631	0.5854	24.8329
7.	1.2925	2.3322	19.54	0.2557	-0.0215	17.3419
8.	1.1050	2.8044	N.A.	0.3165	0.0440	12.1233
9.	1.2300	1.6389	N.A.	0.2259	-0.0023	30.5574
10.	1.3750	1.1586	N.A.	0.3208	0.0911	25.2301
11.	1.3400	2.1826	N.A.	0.3652	0.0765	20.5679
12.	1.2550	1.9589	N.A.	0.1163	0.3206	26.0104
13.	1.5450	1.3635	N.A.	0.2528	0.0668	58.5511
14.	1.3500	1.9114	N.A.	0.1998	0.1424	26.6864
15.	1.5200	1.4275	N.A.	0.2162	0.0799	30.6042
16.	1.0200	4.9144	37.35	0.0777	0.1811	29.9429
17.	1.1533	1.4434	31.57	0.2577	2.0798	26.7052
18.	1.1760	2.7599	N.A.	0.1406	0.5234	24.7884
19.	1.3167	2.4428	N.A.	0.8883	0.6989	19.2699
20.	1.0400	5.1787	00.13	0.1602	-0.1788	24.1810
21.	1.0200	1.4738	N.A.	0.0688	0.7680	24.9455

CONTD.

DATA FOR THE COTTON TEXTILE INDUSTRY

SL.NO.	CAPA	SALE	SHPT	LOPA	LOPT
1.	N.A.	2.0119	5.0682	05.2229	13.0120
2.	N.A.	1.1341	0.6781	01.3494	05.7909
3.	N.A.	0.8231	2.1213	02.7177	05.8728
4.	N.A.	0.6781	3.7979	04.3608	16.5832
5.	N.A.	0.4959	2.0306	01.3576	03.6885
6.	N.A.	0.5952	2.7432	04.4306	21.6095
7.	N.A.	0.3982	5.4074	08.0479	25.4769
8.	N.A.	0.4350	2.9868	04.2438	17.7305
9.	N.A.	0.2667	0.6593	00.7793	02.0574
10.	N.A.	0.4109	3.1355	03.9915	07.6103
11.	N.A.	0.5468	3.9246	06.1389	19.1369
12.	N.A.	0.2696	4.2021	09.5440	20.2504
13.	N.A.	0.2416	1.0061	00.9784	02.2916
14.	N.A.	0.2611	3.4258	04.4820	10.7793
15.	N.A.	0.2588	2.5583	03.0468	14.4025
16.	N.A.	0.1503	1.2175	02.4129	17.5157
17.	N.A.	0.3181	2.7716	03.7729	27.3012
18.	N.A.	0.2527	2.0189	03.4916	12.9099
19.	N.A.	1.4379	5.3703	09.4043	26.2083
20.	N.A.	0.2277	1.7835	01.6267	12.7201
21.	N.A.	0.1390	3.7659	05.6409	14.6630

Notes :

SL.NO.	NAME OF THE COMPANY	YEARS
2.	KHATAU MAK.SPG.& WVG.CO.,LTD.	1985; 1986
4.	BHARAT VIJAY MILLS,LTD.	1987; 1989; 1990
5.	J.K.COT.SPG. & WV.MIL.CO.,LTD.	1986; 1987
7.	PIRAMAL SPG & WVG. MILLS,LTD.	1987; 1989; 1990; 1991
8.	SHRI ARBUDA MILLS,LTD.	1985; 1986
9.	ARUNA MILLS,LTD.	1985; 1986
10.	THE ASHOKA MILLS,LTD.	1985; 1986
11.	MANEKLAL HARILAL MILLS.LTD.	1986; 1990; 1991
12.	VICTORIA MILLS,LTD.	1986; 1991
13.	AHEMEDABAD NEW CT.ML.CO.,LTD.	1985; 1986
14.	NUTAN MILLS,LTD.	1985; 1986
15.	SARASPUR MILLS,LTD.	1985; 1986
16.	THE DHANALAKSHMI MILLS,LTD.	1985; 1990
17.	J.S.R.SPG.& WVG.MILLS CO.,LTD.	1987; 1990; 1991
19.	M.G.SPG.& WVG. CO.,LTD.	1987; 1990; 1991
20.	MAHESHWARI MILLS,LTD.	1985; 1990
21.	AHMEDABAD K.I. MILLS CO.,LTD.	1986; 1990; 1991

ELECTRICAL GOODS AND CABLES INDUSTRY

(1) HCL, LTD.

PRST (3)

- . Within each division products were related to some extent in terms of technology; e.g., the reprographics division produced Micro film Reader Printer, Microfilm Reader, etc.. Distinct groups of products are identifiable across divisions.

MSEL (2)

- . Products were mainly sold in the local markets.
- . Manufacturing and marketing the MAGNUM (the supermini computer) in the U.S.A., through a wholly owned subsidiary.

DMND (2)

- . Products of different divisions were somewhat related. For example, EPABX (of the communication division) and Telephone testing equipment (of the Investment division) were related. Similarly Dot Matrix Printers (of the peripheral division) and Minicomputers/Micro-processor based systems (of the computer division) were related to each other.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (2)

- . Common Contract Division

DIV (2)

- . Computer division; Reprographics Division; Instruments Division; Communication Division; Peripheral Division.

DIVR (2)

- . Refer to the statement under DIV.

- . Collaboration with (a) Apollo, U.S.A.; (b) Hewlett-Packard Company, U.S.A.; (c) UNIX; (d) MAGNUM, U.S.A.

KALN (2)

- . The company was getting capital by issuing non-convertible debentures which were not related to a particular product.
- . "During 1987-88, ICICI sanctioned a rupee term loan of Rs.7.42 crores for the establishment of the company's expansion and diversification project."

(2) INCAB INDUSTRIES, LTD.

PRST (2)

- . Products were somewhat related across divisions.

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crore)	(Rs. in crore)
1990-91	13.84	171.78

DMND (1)

- . Products were highly related across divisions. For example, Cable and wire and Rolling of Rods.

MNCS (1)

- . Foreign equity holding was 13.23%.
- . No use of foreign brand name.

COMN (2)

- . Common Contract Division
- . Common R and D Department

DIV (3)

- . Rod Mill; Wire Mill; Winding wires; Rubber insulated cables; Paper insulated power cables and Thermoplastic cable.

DIVR (3)

- . New types of cables and conductors, e.g., X-ray cables, Kapton conductors and PT FE wires etc., were introduced into the markets.
- . LTXLPE compound was developed and introduced into the manufacturing lines.
- . New plants at Pune and Jamshedpur were established for the production of rubber and plastic cables.

KALN (3)

- . "Plans were a foot to manufacture jelly filled telecommunication cables and extral hitension XLPE cables." Capital was allocated for this purpose.
- . "Modernisation of the enamelling wire plant."
- . Purchasing a plant at Pune to manufacture 800 Km. of PVC power cables.
- . Set up a plant at Jamshedpur for the manufacture of Jelly filled telecommunication cable.

(3) ASEA BROWN BOVERI, LTD.

PRST (3)

- . Products were distinct across divisions.

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crores)	(Rs. in crores)
1982-83	1.01	43.85

DMND (2)

- . Products of different divisions were somewhat related.

MNCS (1)

- . Foreign equity holding was 36.94%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (2)

- . Rotating Machinery Division; Project Engineering Division; Power Equipment Division; Electronics Division; Motor Division; Turbocharger Division; Electronic Motor manufactured Division.
- . Foreign contract division.

DIVR (2)

- . Refer to the statements under DIV.
- . The company introduced high voltage contractors and control switches, relay and signalling equipments and so on.
- . Collaboration with AG Kunhle, Kopp and Kauch, West Germany.
- . Collaboration with Integra Ltd., Zurich, Switzerland.

KALN (2)

- . Capital was allocated to set up a new factory at Mysore for manufacturing various electronics products.
- . Capital was allocated for the modernization of plants situated at Baroda and Faridabad.
- . "The Company was to invest upto Rs.50 lakhs in the equity capital of GPM (Gujarat Prime Movers Ltd.)..." for the manufacture and supply of turbines.

(4) KELVINATOR OF INDIA, LTD.

PRST (3)

- . Distinct groups of products across divisions are as follows:
Group No. (a) Refrigerators, Deep Freezers, Additional compressors.
Group No. (b) Electrical Grade Lamination (MT), Electrically operated cash registers, electronic cash

registers.

Group No. (c) Scooters, Mopeds.

Group No. (d) Microwave ovens, etc..

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crores)	(Rs. in crores)
1988-89	3.55	228.76

DMND (3)

- . Within each group products were highly related. But distinct groups of products are identifiable across divisions.

MNCS (2)

- . Foreign equity holding was 12.29%.
- . Use of foreign brand name Kelvinator.

COMN (2)

- . Common Foreign Contract Division
- . Common R and D Department

DIV (2)

- . Control division; Scooter plant; Electrical grade stampings factory; Electro mechanical cash registers factory; Refrigeration division.
- . "In 1984-85, the performance of centralised tool rooms, the lamination and the control division were satisfactory."
- . Foreign Contract Division
- . R and D department

DIVR (2)

- . Refer to the statements under DIV.
- . Collaboration with (a) Kelvinator International corporation, U.S.A in 1978; (b) A.T.E.A. Spa, Italy; (c) White consolidated Industries Inc., U.S.A., in 1985-86.

- . Aravalli Svachalit Vahan Ltd., was merged with the company.
- . Expo machinery Ltd., and Kelbex International Ltd., were the wholly owned subsidiaries of the company.

KALN (3)

- . In 1982-83, considerable amount of funds was spent in establishing the scooter plant at Alwar.
- . Capital was allocated to undertake modernization of the manufacturing operation in the refrigeration division.
- . A new project was implemented at the compressor division.
- . "During 1989-90, setting up of a project for the manufacture of super enamelled copper wire was in progress. Total cost... Rs.4.80 crore."

(5) HEG LTD.

PRST (3)

- . Technologically products were distinct across divisions.

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crores)	(Rs. in crores)
1982-83	2.65	27.44

DMND (3)

- . Products were distinct across divisions.

MNCS (1)

- . Foreign equity holding was 27.04%.
- . No use of foreign brand name.

COMN (2)

- . Common Foreign Contract Division
- . Common R and D Department

DIV (3)

- . Construction Division; Graphite Division; Sponge iron division; Textile Division; Paper Project Division; Oil Division.

DIVR (2)

- . Refer to the statement under DIV.
- . Collaboration with a Norwegian Company for oil exploration.
- . Collaboration with La Societe Des Electrodes Et Refractaires Soviet (SERS), France.
- . In 1989-90, the company acquired a textile unit.
- . "In 1982-83, the Company entered into a joint sector agreement with Industrial promotion and Investment corporation of Orissa Ltd."

KALN (3)

- . "During 1985-86, the Company issued 15% secured non-convertible debentures of the aggregate face value of Rs.7.60 crores on rights basis to finance part of the project cost of the Jammu spinning unit and to meet working capital requirement."
- . Investment of Rs.200 lakhs to establish a ceramic apparatus insulator project.
- . "The company undertook a Rs.7.60 crores modernisation programme to enable production of longer length electrodes and ultra high power electrodes...."
- . "The financial institutions sanctioned loans of Rs. 5.99 crores for modernisation of the graphite plant."

(6) BLUE STAR, LTD.

PRST (2)

- . Products were somewhat related across divisions.

MSEL (2)

- . "The Company secured a major contract worth U.S. \$11.6 million for air-conditioning of the Presidential palace complex in Damascus."
- . In 1987, water coolers and air-conditions were exported to Nigeria.
- .

Year	Exports (Rs. in crores)	Domestic Sales (Rs. in crores)
1988-89	3.79	106.39

DMND (3)

- . Products were distinct across divisions.

MNCS (1)

- . Foreign equity holding was 1.27%.
- . No use of foreign brand name.

COMN (1)

- . Each plant had separate functional divisions located at different places. There was no common use of resources by each of these plants.

DIV (3)

- . Thane plant was producing centrifugal packaged chillers, air handling equipments, walk-in-coolers, semi-hermetic reciprocating chillers.
- . Baruch plant was producing environmental test chambers, strip procussing lines.
- . Gandhi nagar plant was producing EPABX, analytical instruments, gas chormatographs, liquid chromatorgraphs.
- . Bangalore plant was producing computers.

DIVR (2)

- . Refer to the statements under DIV.
- . "During 1986-87, a new joint venture called YoKogawa Keonics Ltd., was set up with YoKogawa Electric Corporation (KEONICS)...."
- . "In 1983-84, the Company signed technical collaboration with York International, U.S.A...."
- . "The Company proposed to manufacture... environmental test chambers under technical licensing agreement with Tenney Engineering Inc.,U.S.A."

KALN (3)

- . Capital was allocated for the expansion programme of the Bharuch Plant and Thane Plant.
- . Capital was allocated to acquire land in Gandhinagar to have a plant which will produce EPABX.

(7) PSI DATA SYSTEMS, LTD.

PRST (1)

- . Products were highly related.

MSEL (2)

- . "During 1990-91, the overall turnover... to Rs.22.80 crores and exports at Rs. 814 lakhs...."
- . "...a 100% export oriented Software Technology Park was set up...and ...to become operational duirng 1991-92."

DMND (2)

- . Products were somewhat related.

MNCS (1)

- . Foreign equity holding was 29.97%.
- . No use of foreign brand name.

COMN (2)

- . Common Foreign Contract Division

DIV (2)

- . A separate division producing 8 bit/16 bit systems.
- . Division producing 16 bit machine.
- . Division producing telecommunication equipments.
- . Foreign contract division

DIVR (2)

- . Collaboration with (a) Phoneix, U.S.A.; (b) Bull SA, France.
- . Foreign collaboration for a new plant at Pcenya.

KALN (2)

- . "The main object of the issue of equity shares and debentures was to finance the mainframe project of the Company and to augment long term resources."

(8) HYDERABAD LAMPS, LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (1)

- . The company was selling products only in the domestic market.

DMND (3)

- . Products were distinct.

MNCS (1)

- . Foreign equity holding was 7.47%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate division is observable.

DIVR (1)

- . In 1985, a new product Glass shell was introduced. But no information is available about the separate divisions.

KALN (1)

- . No information is available.

(9) PUNJAB ANAND LAMP INDUSTRIES, LTD.

PRST (2)

- . Technologically products were somewhat distinct.

MSEL (1)

- . The company was selling products only in the domestic market.

DMND (1)

- . Products were mostly related.

MNCS (1)

- . Foreign equity holding was 27.0%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No information is available about the separate product divisions.

DIVR (1)

- . No new product was introduced.

KALN (2)

- . "The collaborators participated in the equity capital of the Company...."
- . The company was getting loans for the company's original project.

(10) OTIS ELEVATOR CO. (INDIA), LTD.

PRST (2)

- . Technologically products were somewhat related. For example,

- . The company was allocating capital from time to time but not product-wise.

(11) ELECTRA (INDIA), LTD.

PRST (3)

- . Distinct groups of products are identifiable.

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crores)	(Rs. in crores)
1985-86	10.38	10.98

DMND (2)

- . Products were somewhat related.

MNCS (1)

- . Foreign equity holding was 0.07%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (1)

- . The company had diversified into different products but not through divisionalisation. For example, toroidal and split wound cores, stampings for rotating machinery and booster transformers, etc., products were launched within the same product division.

KALN (3)

- . The company was allocated capital (a) to start a new project for the manufacture of toroidal and split wound cores, stampings for rotating machinery and booster transformers; (b) to establish an amusement and educational institution named Electra world;

(c) to take-up a project for the construction of a commercial-cum-residential complex at Meerut.

(12) KHAITAN TIBREWALA ELECTRICALS, LTD.

PRST (1)

- . Technologically the company's products were highly related to each other.

MSEL (1)

- .

Year	Domestic Sales
	(Rs in crores)
1990-91	16.33
- . No information is available on exports.

DMND (1)

- . Products were mostly related.

MNCS (1)

- . Foreign equity holding was 0.01%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . The Oscillating type air circulators was launched by the company during the period 1987-89.
- . "In 1983, the Company undertook... a second plant ...at Bachepalli ... to manufacture a wide range of portable and other fans and household electrical appliances."
- . Collaboration with Khaitan Pvt. Ltd.
- . "Jhunjhunu Holding Ltd., became a wholly owned subsidiary of the

Company during 1987."

KALN (3)

- . Capital was allocated for Medak Plant.
- . "The object of the public issue of capital... was to augment the Company's working capital and to provide funds for normal capital expenditure other than for substantial expansion and diversification."

(13) DYNAVISON, LTD.

PRST (1)

- . Technologically the company's products were highly related to each other.

MSEL (1)

- . The company was selling products in the domestic market only.
- . Total sale was Rs. 68.0 crores in 1991-92.
- . No information is available on exports.

DMND (1)

- . The company's products were mostly related.

MNCS (1)

- . Foreign equity holding was 0.0%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . In 1982, the company started production of color T.V. sets.
- . The company undertook a project to manufacture the radio cassette recorders and stereo music systems.

- . Collaboration with (a) Matsushita Electronic Industries Co.Ltd.;
- (b) Matsushita Electronic component Co.Ltd.

KALN (3)

- . Capital was allocated for (a) the Kottivakkan project for the production of stereo music systems; (b) the Kandhanchavadi project for the production of printed circuit board.

(14) KHAITAN FANS (INDIA), LTD.

PRST (1)

- . Technologically the company's products were highly related across divisions.

MSEL (1)

- . Year Domestic Sales
(Rs. in crores)
1990-91 22.43
- . No information is available on exports.

DMND (2)

- . To some extent the products of the different divisions were related.

MNCS (1)

- . Foreign equity holding was 0.0%.
- . No use of foreign brand name.

COMN (2)

- . Common Stamping Division at Noida .

DIV (3)

- . Industrial fans Division; Domestic fans Division.

DIVR (3)

- . "The industrial fans division was established for the manufacture of air circulators, mancoolers, exhaust and axial flow fans."
- . "During 1987-88, Magnet Holding Ltd., became a subsidiary of the Company."
- . "With effect from 1st October, 1989, 'Khaitan Industrial Complex ltd.', was amalgamated with the Company."

KALN (2)

- . The company was allocated capital for the modernisation programme as well as the expansion programme.

(15) SYLVANIA & LAXMAN, LTD.

PRST (2)

- . Products like, glass shells and tubes were somewhat related.

MSEL (2)

Year	Domestic Sales
	(Rs in crores)
1990-91	47.22

- . No information is available on exports.

DMND (1)

- . The company's products were highly related.

MNCS (2)

- . Foreign equity holding was 15.80%.
- . Use of foreign brand name, e.g., Sylvania Electric Products, Ind., New York.

COMN (2)

- . Common Marketing Department
- . Common Foreign Contract Department

DIV (3)

- . Lighting Division; Electronic Division; Luminaries Division.

DIVR (2)

- . Refer to the statements under DIV.
- . "A new range of color T.V., sets based on the latest German technology were to be introduced during February - March 1986."
- . The company chose to widen its marketing range.
- . Technical collaboration with an European manufacturer for the production of High Pressure Sodium Vapour Lamps.
- . Collaboration with M/s. Dy AIRAM AB., Finland.
- . "During 1988-89, a fluorescent lamp project... was implemented at Ajay Electrical Industries, Ltd., Mohali, Punjab with the Company's technical support and assistance."

KALN (3)

- . The company was allocated capital for the modernisation programme of the NOIDA fluorescent tube plant.
- . "In 1981-82, the Company installed a new M-26 olivoto bulb blowing machine... at a total cost of about Rs.180.30 lakhs."
- . Capital allocated for the glass tube draw furnace.

(16) POLAR INDUSTRIES, LTD.

PRST (1)

- . Technologically products of the different divisions were highly related.

MSEL (2)

Year	Exports	Total Turnover
	(Rs. in Lakhs)	(Rs. in Lakhs)
1990-91	48.51	2400.00

DMND (2)

- . Products of the Fan division and Lamination division were some-what related.

MNCS (1)

- . Foreign equity holding was 0.01%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Fan Division and Lamination Division.

DIVR (3)

- . Refer to the statements under DIV.
- . "The company chose to set up an expansion project at NOIDA with an installed capacity of 1,20,000 electric fans per annum."
- . "During 1989-90, the Company undertook to set up a lamination project to expand its activities vertically."

KALN (2)

- . The company was allocated capital for the lamination project as well as for the NOIDA plant producing electric fans.

(17) O/E/N CONNECTORS, LTD.

PRST (2)

- . The company's products were somewhat related technologically.

MSEL (2)

Year	Exports	Domestic Sales
	(Rs. in crores)	(Rs. in crores)
1990-91	0.78	11.04

DMND (2)

- . The company's products were somewhat related.

MNCS (1)

- . Foreign equity holding was 35.67%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . The company does not have any separate product division.

DIVR (2)

- . "The Company entered into a technical collaboration agreement with M/s. Souriau and Cie., Paris, France...."
- . "The Company proposed to manufacture TV control units in technical collaboration with M/s. Preh, West Germany."
- . "An agreement... with Preh Singapore (Pte).Ltd.,... in 1984-85."
- . Introduction of two additional ranges of connectors e.g., D-Subconnectors and reverse Euro connectors.

KALN (3)

- . The company proposed to manufacture flat cable connectors, heavy duty connectors, etc., for which Rs.70 Lakhs was allocated for that project.
- . "..., the Company was to pay the collaborators French Francs 1.2 million as lumpsum fee for know-how...."

DATA FOR THE ELECTRICAL GOODS AND CABLES INDUSTRY

SL.NO.	NAME OF THE COMPANY	CVSI	CVVI	DUMY	PRST
1.	H.C.L.,LTD.	42.9289	07.8252	0	3
2.	INCAB INDUSTRIES,LTD.	44.7236	89.2094	1	2
3.	ASEA BROWN BOVERI.,LTD.	27.9327	15.4384	1	3
4.	KELVINATOR OF INDIA,G.,LTD.	29.3981	19.1911	1	3
5.	H.E.G.,LTD.	16.8744	22.4291	1	3
6.	BLUE STAR,LTD.	18.6080	16.6014	1	2
7.	PSI DATA SYSTEMS,LTD.	13.7033	21.1295	0	1
8.	HYDERABAD LAMPS,LTD.	01.2818	21.8429	0	3
9.	PUNJAB ANAND LAMP IND.,LTD.	25.7620	13.2236	0	2
10.	OTIS ELEVATOR CO.(IND.),LTD.	27.5916	16.9419	1	2
11.	ELECTRA (INDIA),LTD.	27.0311	22.5243	1	3
12.	KHAITAN TIBREWALA ELEC.,LTD.	20.1735	19.3251	1	1
13.	DYNAVISON,LTD.	24.5642	50.4606	1	1
14.	KHAITAN FANS (INDIA),LTD.	65.0094	93.4465	0	1
15.	SYLVANIA & LAXMAN,LTD.	14.4149	17.9422	1	2
16.	POLAR INDUSTRIES,LTD.	45.8622	20.0158	0	1
17.	O/E/N CONNECTORS,LTD.	46.2613	16.9987	0	2

CONTD. DATA FOR THE ELECTRICAL GOODS AND CABLES INDUSTRY

SL.NO.	MSEL	DMND	MNCS	COMN	DIV	DIVR	KALN	WAGE
1.	2	2	1	2	2	2	2	12.8981
2.	2	1	1	2	3	3	3	13.0120
3.	2	2	1	2	2	2	2	10.5590
4.	2	3	2	2	2	2	3	06.4239
5.	2	3	1	2	3	2	3	08.9442
6.	2	3	1	1	3	2	3	11.6894
7.	2	2	1	2	2	2	2	20.1962
8.	1	3	1	1	1	1	1	13.1505
9.	1	1	1	1	1	1	2	04.1437
10.	2	3	2	2	2	2	2	41.2111
11.	2	2	1	1	1	1	3	08.4548
12.	1	1	1	1	1	2	3	02.4556
13.	1	1	1	1	1	2	3	02.0262
14.	1	2	1	2	3	3	2	04.0889
15.	2	1	2	2	3	2	3	17.4109
16.	2	2	1	2	3	3	3	03.6922
17.	2	2	1	1	1	2	3	08.8386

CONTD. DATA FOR THE ELECTRICAL GOODS AND CABLES INDUSTRY

SL.NO.	LQID	DEBT	EQTY	ASET	GRTH	VRTI
1.	1.1540	3.1336	07.50	1.5258	1.1206	026.4722
2.	1.6240	2.1799	00.47	1.0049	1.0924	044.5102
3.	1.1940	3.2117	00.50	1.4803	0.7549	026.2261
4.	1.5140	2.4627	02.17	1.1453	0.8645	015.0593
5.	1.8020	1.6093	02.66	0.8701	0.4136	028.7091
6.	1.2240	2.5968	18.22	0.8395	0.5179	016.4149
7.	1.2700	3.7266	06.80	0.1621	0.5362	040.0515
8.	1.0550	1.6965	03.51	0.2339	0.7687	012.4242
9.	0.6950	3.3361	00.28	0.2256	0.0004	013.3065
10.	1.1680	4.2590	00.32	0.7773	2.0000	104.6518
11.	2.1475	3.9719	18.66	0.2838	0.8827	018.2039
12.	1.4760	1.4889	04.38	0.1343	0.5243	031.6319
13.	1.1080	4.5474	00.00	0.3429	1.3176	022.2815
14.	1.3340	2.5499	01.54	0.1018	0.7014	068.7307
15.	1.1725	2.8334	10.33	0.3011	0.0468	014.4358
16.	1.1340	4.3636	08.88	0.1209	1.2026	023.1242
17.	2.0500	1.4598	06.77	0.0955	0.9844	032.6819

CONTD. DATA FOR THE ELECTRICAL GOODS AND CABLES INDUSTRY

SL.NO.	CAPA	SALE	SHPT	LOPA	LOPT
1.	032.1451	1.6181	05.6406	05.8039	19.9524
2.	021.3348	1.1929	05.2023	04.4509	13.7241
3.	036.8736	1.4564	02.7672	02.8387	10.7809
4.	039.2195	2.3969	02.3958	05.2948	17.2303
5.	098.1667	0.8315	04.8203	04.2126	11.3744
6.	038.1096	1.4732	02.3229	04.1144	14.8215
7.	010.7049	0.1066	03.9521	04.4738	20.4851
8.	078.2649	0.1041	07.0476	04.0354	11.0582
9.	073.6143	0.1554	04.6284	03.8939	15.6104
10.	109.6429	0.5572	07.2484	04.3945	23.1315
11.	031.0796	0.3264	04.1618	04.9181	21.6847
12.	026.1802	0.1577	05.0523	06.0705	16.2452
13.	046.2578	0.4898	01.7307	03.8128	16.6226
14.	048.995	0.1222	08.0595	04.9170	38.1784
15.	095.7474	0.3843	01.4608	01.9299	04.5166
16.	049.2480	0.1429	04.2303	04.8664	21.7175
17.	053.3462	0.0748	20.5343	14.4962	34.8701

Notes :

SL.NO.	NAME OF THE COMPANY	YEARS
7.	PSI DATA SYSTEMS,LTD.	1986; 1987
8.	HYDERABAD LAMPS,LTD.	1986; 1991
9.	PUNJAB ANAND LAMP IND.,LTD.	1989; 1991
11.	ELECTRA (INDIA),LTD.	1987; 1988; 1989; 1990
15.	SYLVANIA & LAXMAN,LTD.	1986; 1987; 1990; 1991
17.	O/E/N CONNECTORS,LTD.	1987; 1989; 1990; 1991

GENERAL ENGINEERING INDUSTRY

(1) MOTOR INDUSTRIES CO, LTD.

PRST (3)

- . Different machines and technologies were used to produce the products across the divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1989	242.10	21.69

DMND (1)

- . Most of the products were complementary to each other.

MNCS (2)

- . Foreign equity holding was 51.74%.

COMN (2)

- . Common R and D Department

DIV (3)

- . Bangalore factory produced single cylinder fuel injection pumps, starter motors and alternators, gear pumps, NG valves for alternators, hydraulic gear pumps etc.
- . Nasik factory produced nozzle holders, multicylinder fuel injection pumps etc.

DIVR (3)

- . Refer to the statements under DIV.
- . New products were launched by the Bangalore and Nasik factories.

KALN (3)

- . "In 1987, under the modernisation programme, the company added a number of new machines both at the Bangalore and Nasik factories."

- . "During 1985, steps were taken to develop a manufacturing programme to manufacture 59,500 multicylinder fuel injection pumps at Nasik."
- . "The company identified gear pumps and NG valves for alternators and starter motors commenced at Naganathapura Plant."
- . Capital allocated for "A 'cold start' facility enabling testing of engine...."
- . "... for manufacture of starter motors and alternators... the company proposed to put up a factory at Bangalore...."

(2) KIRLOSKAR CUMMINS, LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1989-90	191.66	35.50

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 51%.

COMN (2)

- . Common R and D Department

DIV (3)

- . Auto Division produces bus.
- . Division produces parts of 'K' engine models.
- . Division produces generating sets.

DIVR (2)

- . Refer to the statements under DIV.

- . Collaboration with RABA Hungarian Railway carriage and Machine work Gyor, Hungary.
- . "In 1978-79, the company obtained a limited licence for the manufacture of 500 (Neoplan) buses in collaboration with Gottlob Auwärter GmbH & Co., West Germany."
- . "Cummins Engine Co. Inc, U.S.A. are the collaborators for the manufacture of engines."
- . "Cummins Diesel Sales and Services (India) Ltd., became a wholly owned subsidiary of the company in 1986-87."

KALN (3)

- . Refer to statements under 'DIVR'.
- . Product wise capital allocation was observed.

(3) VOLTAS LTD.

PRST (2)

- . Products were somewhat related across divisions.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs. Crores)
1987-88	544.70	+ ve

DMND (2)

- . Products were somewhat related.

MNCS (1)

- . Foreign equity holding was 6.51%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common R and D Department

DIV (3)

- . Air-conditioning and Refrigeration Division; Electrical Division; Machine tools Division; Textile Machinery Division; The project engineering Division; The mining and conveying Equipment Division; The Earth moving and construction Division.

DIVR (2)

- . Refer to the statements under DIV.
- . Collaboration with carrier corporation, U.S.A.
- . Collaboration with Merlin and Gerin, France.
- . "Voltas International Ltd.(VIV), was... a wholly owned subsidiary of the company."
- . "Vision Investment Co.Ltd.,...., is also a subsidiary of the company."
- . "Voltas Systems Ltd., became a subsidiary of the company...."
- . "Wandleside National Conductors Ltd., became a subsidiary of the company...."

KALN (3)

- . During 1982-83, the company allocated capital to establish Warora plant and Thane Plant.
- . Rs.9.6 crores spent for the joint venture, named 'Pepsi Foods Private Limited.'

(4) INGERSOLL-RAND (INDIA),LTD.

PRST (3)

- . Distinct groups are identifiable.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	106.00	26.6

DMND (3)

- . Independent groups are identifiable.

MNCS (2)

- . Foreign equity holding was 74.05%.

COMN (1)

- . No information is available.

DIV (3)

- . Karnataka factory produced hammer drills, water-well drills, light drills, heavy duty blast hole drills.
- . Gujarat factory produced air and gas compressors, etc.

DIVR (3)

- . Refer to the statements under DIV.
- . "The company set up a new plant at Bangalore in 1978...."

KALN (3)

- . The company allocated capital for Karnataka and Gujarat factories producing different kinds of products.

(5) EICHER MOTORS, LTD.

PRST (2)

- . Products were somewhat related.

MSEL (2)

- . The company sold 4455 cars in the domestic market and exported Rs.2.37 crores worth of cars during 1989-90.
- . During 1990-91, the company sold cars in the domestic market worth of Rs.136 crores and also exported.

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 22.37%.

. Use of foreign brand name EICHER.

COMN (1)

. The company had only one product division.

DIV (1)

. Refer to the statement under COMN.

DIVR (1)

. No new product was introduced.

KALN (3)

. "The company undertook to set up a project for the manufacture of Mitsubishi 'Canter' series of commercial vehicles...."

(6) KSB PUMPS, LTD.

PRST (3)

. Distinct groups are identifiable across product divisions.

MSEL (1)

. Year Domestic Sales

(Rs. Crores)

1991 57.06

. The company was selling only in the domestic market.

. No information is available on exports.

DMND (3)

. Independent groups are observed.

MNCS (2)

. Foreign equity holding was 40.02%.

. Use of foreign brand name KSB.

COMN (2)

. Common Marketing Department

DIV (3)

. Power Projects Division; Foundry Division; Water Pumps and Valves

Division.

DIVR (2)

- . Set up a project at Pimpri, Pune.
- . Collaboration with VELAN Inc., Montreal, Canada.
- . "Grade-D-Castings Ltd., is a subsidiary of the company."

KALN (3)

- . "The company's modernisation and expansion project for the manufacture of process pumps was undertaken at Pimpri, Pune...."
- . For Coimbatore project "... ICICI sanctioned term loans of Rs.640 lakhs."

(7) ALFA LAVAL (INDIA), LTD.

PRST (2)

- . Products were somewhat related.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1990-91	108.86	25.0

DMND (2)

- . Refer to the statement under PRST.

MNCS (2)

- . Foreign equity holding was 40.14%.
- . Use of foreign brand name Alfa-Laval AB.

COMN (2)

- . Common R and D Department

DIV (3)

- . Satara Factory produced dairy equipments.
- . Pune Factory produced other types of products.

DIVR (2)

- . During 1990-91, the company opted for a collaboration agreement with Saunders valve Co.Ltd.
- . In 1977, the company diversified into the manufacture of sophisticated moulding and blasting machines and hydraulic presses with technical assistance from Arenoe BMD Machinen fabrik Gmbtt, West Germany.
- . Collaboration with Titanus Fabricators, Ltd., U.K., in 1979.
- . "Satt control (India) Ltd., became a subsidiary of the company during 1987-89 (15 months)."

KALN (3)

- . "During 1990-91, a technology centre was set up at Pune...."
- . "The company undertook to set up a factory at Satara,...."
- . Rs.4 crores was allocated for Saunders Valves (India) Ltd.
- . Capital was allocated for re-gasketting unit at Pune Factory.

(8) EICHER TRACTORS, LTD.

PRST (1)

- . Same kind of technology was used to produce the products.

MSEL (1)

Year	Turnover (Rs. Crores)
1990-91	227.26

- . The company was selling products only in the domestic market.
- . No information is available on exports.

DMND (1)

- . Products were highly related across divisions.

MNCS (1)

- . Foreign equity holding was 2.79%.

- . No use of foreign brand name.

COMN (2)

- . "The marketing division of EGL was transferred to ETL and with this the company... provides country-wide tractor sales and service network."
- . "..., the company was to market the entire production of CAFEL under the brand name Eicher."

DIV (3)

- . The company had three factories located in Haryana, Rajasthan and H.P.

DIVR (3)

- . 30,35 and 40 H.P., ranges tractors had been launched.
- . New products were produced by the three factories of the company.

KALN (3)

- . "During 1986-87, the company undertook modernisation of its manufacturing plants at a total estimated cost of Rs.7.6 crores...."
- . "The company invested around Rs.2.5 crores in the equity share capital of Enfield India Ltd., Madras with participation in its management."

(9) MAHARASHTRA SCOOTERS, LTD.

PRST (1)

- . The company was producing only one product scooters.

MSEL (1)

. Year	Domestic Sales
	(Rs. Crores)
1986-87	95.10

- . The company was selling product only in the domestic market.
- . No information is available on exports.

DMND (1)

- . Refer to statement under PRST.

MNCS (1)

- . Foreign equity holding was 0.03%.
- . No use of foreign brand name.

COMN (1)

- . Only one product division is observable.

DIV (1)

- . Refer to the statement under COMN .

DIVR (1)

- . No new product was introduced.

KALN (3)

- . The company was allocated capital for the only product.

(10) TIL, LTD.

PRST (2)

- . Somewhat common technology was used to produce the products across the divisions.

MSEL (1)

. Year	Turnover
	(Rs. Crores)
1989-90	50.54

- . The company was selling its products only in the domestic market.
- . No information is available on exports.

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 19.13%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . "...the company obtained the dealership for marketing Hindustan motors earthmoving equipment."

DIV (3)

- . Material Handling Division; Construction Equipment Division; Process Equipment Division.

DIVR (2)

- . Refer to the statement under DIV.
- . "...collaboration with Halliburton services, Duncan, Oklahoma, U.S.A."
- . "Negotiations were on with overseas manufacturers of a wide range of underground mining machinery."
- . "In 1987, the company along with Halliburton of U.S.A. set up a joint venture company...."

KALN (3)

- . "On this joint venture (Halliburton Oilfield services India Ltd.), the company was to invest upto 9,36,000 equity shares of Rs.10 each."
- . Capital was allocated for the modernisation programme of Delhi and Bombay units.

(11) FLAKT INDIA, LTD.

PRST (1)

- . Common inputs and technology were used to produce the products across the divisions.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1990	54.06	5.01

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 51.05%.
- . Use of foreign brand name FLAKT.

COMN (2)

- . Common Marketing Department
- . Common Technical Collaboration Department

DIV (3)

- . Two plants located in Calcutta and Tiruvekadu
- . Produced different kinds of products .

DIVR (2)

- . Refer to the statements under DIV.
- . Collaboration with Flakt AB, Sweden.
- . Collaboration with Noske Kaeser Gmbtt, West Germany.
- . Collaboration with Stal Refrigeration AB, Sweden.

KALN (3)

- . Capital was allocated for on-line computerisation.
- . "During 1989, work for the development of two new types of fabric filters were taken up...."

(12) WORTHINGTON PUMP INDIA, LTD.

PRST (1)

- . Common inputs and technology were used to produce the products across divisions.

MSEL (2)

- . The company exported to S.E. Asia, Brazil and North America.
- . The company was selling its products in the domestic market also.

DMND (2)

- . Somewhat products were substitutable.

MNCS (2)

- . Foreign equity holding was 24.81%.
- . Use of foreign brand name WORTHINGTON.

COMN (2)

- . Common Marketing Department
- . Common Technical Collaboration Department

DIV (3)

- . The company had two plants located in West Bengal and Ghaziabad. Each plant produces specific products.

DIVR (2)

- . Refer to the statements under DIV.
- . "Clivia Investments Ltd., is a wholly owned subsidiary of the company."
- . "The company entered into another technical collaboration agreement with Hayward Tyler Ltd., England...."

KALN (3)

- . "During 1983-84 (18 months), the company proposed to modernise its plants at Panihati and Ghaziabad."
- . "During 1987-88, the hydraulic test facilities constructed at the Panihati factory...."
- . "During 1989-90, a special testing facility for testing process pumps... was designed and taken up for commissioning."

(13) KUNAL ENGINEERING CO., LTD.

PRST (1)

- . Same kind of inputs and technology were used to produce the products.

MSEL (2)

Year	Domestic Sales	Exports
	(Rs. Crores)	(Rs. Crores)
1989-90	23.54	2.41

DMND (1)

- . Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 8.07%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product division is observable.

DIVR (2)

- . Collaboration with spindel motorenund Maschinenfabrik AG. Switzerland.
- . Collaboration with Rsiners and Furst, West Germany.

KALN (3)

- . Capital was allocated for Yarn Carriers Project.
- . Capital was allocated for the modernisation programme of the spindles insert expansion project.

(14) SIPANI AUTOMOBILES, LTD.

PRST (1)

- . Same technology was used to produce the products.

MSEL (2)

- . The company exported Montana Cars to Sweden.
- . Products were available in the domestic market also.

DMND (1)

- . Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . Only one product division is observable.

DIVR (2)

- . Introduction of new model of car within the same division.
- . " A Technical collaboration... with Reliant motors, U.K...."
- . "During 1990-91, the company entered into a joint venture agreement with the U.P. Government for takeover of the management of Auto Tractors Ltd. (ATL), Pratapgarh."

KALN (3)

- . Capital was allocated for the modernisation and expansion of the Bangalore Factory mainly producing various models of cars.

(15) RANE (MADRAS) LTD.

PRST (1)

- . Same kind of technology was used to produce the products across divisions.

MSEL (2)

- . "During 1985-86, the company entered into a technical aid agreement with TRW Ehrenreich... to ensure an easier entry into

the new OEM markets."

- . Products are available in the domestic market also.

DMND (1)

- . Products were highly related because these were used for a specific purpose.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department
- . Common Contract Department

DIV (3)

- . Mysore Unit produced steering gears.
- . Rest of the products were produced at Madras unit.

DIVR (2)

- . "... technical collaboration with M/s.Burman & Sons, Ltd., of U.K...."
- . "...collaboration agreement with Automotive Products, Ltd., U.K...."
- . "During 1985-86, the company entered into a technical aid agreement with TRW Ehrenreich."
- . "During 1987-88, 'Rane Power Steering Ltd.' was incorporated as a wholly owned subsidiary of the company...."

KALN (3)

- . "In 1981-82, the company undertook to set up a project in Mysore...."
- . Capital was allocated for the expansion of the installed capacity of steering gears.

(16) MASCHINEN FABRIK POLYGRAPH (INDIA), LTD.

PRST (1)

- . Same kind of technology was used.

MSEL (2)

Year	Domestic Sales (Rs. Crores)	Exports (Rs. Crores)
1989-90	16.99	12.08

DMND (3)

- . Independent groups are identifiable.

MNCS (1)

- . Foreign equity holding was 0.05%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . The company had the only product division located in Kolhapur.

DIVR (2)

- . New products had been launched through the same product division.
- . "Technical collaboration agreement... with VEB polygraph Leipzig, GDR...."
- . "During 1989-90, the company entered into a technical collaboration agreement with M/S. Soine Offset AB, Sweden...."

KALN (3)

- . "During 1983-84, the company finalised an expansion programme at an estimated cost of Rs.187 lakhs...."
- . The company was allocated capital for the collaboration agreement with Plamag, GDR.

(17) S.S. MIRANDA, LTD.

PRST (1)

- . Same kind of technology was used to produce the products across divisions.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs. Crores)
1989-90	17.45	0.26

DMND (3)

- . Distinct groups are identifiable.

MNCS (1)

- . Foreign equity holding was 0.00%.
- . No use of foreign brand name.

COMN (2)

- . Common Marketing Department

DIV (3)

- . Tools Division; Manufacturing Division; Tradings Division; Powder Metal Products Division.

DIVR (2)

- . Refer to the statements under DIV.
- . Introduction of new products like high speed steel, bi-metal bandsaws etc.
- . Collaboration with Imperial Clevite Inc., U.S.A.

KALN (3)

- . Capital was allocated to have an electronics unit at Baroda.
- . "During 1982, the company undertook to diversify its activities.... A site for this purpose was chosen at Ankleshwar...."

(18) REINZ - TALBROS, LTD.

PRST (2)

- . Somewhat common technology was used across divisions.

MSEL (1)

- . Products were available in the domestic market.
- . No information was available on exports.

DMND (2)

- . Products were somewhat complementary to each other.

MNCS (2)

- . Foreign equity holding was 22.99%.
- . Use of foreign brand name REINZ.

COMN (2)

- . Common R and D Department
- . Common Contact Department

DIV (3)

- . Mohan Nagar Factory produced soft gasket materials.
- . The company set up a project at Ghaziabad for the production of remote mechanism.

DIVR (2)

- . Refer to the statements under DIV.
- . Collaboration with Reinz - Dichtungs GmbH (FRS).
- . Collaboration with Watson Grange, U.K.

KALN (3)

- . Capital was allocated for the Ghaziabad project as well as for the Mohan nagar Factory.

(19) XLO-GWB CARDAN SHAFTS, LTD.

PRST (1)

. The company was producing only one product.

MSEL (2)

Year	Turnover (Rs. Lakhs)	Exports (Rs. Lakhs)
1988-89	824.66	38.65

DMND (1)

. Refer to the statement under PRST.

MNCS (2)

. Foreign equity holding was 26.00%.

. Use of foreign brand name GWB.

COMN (1)

. Refer to the statement under DIV.

DIV (1)

. The company had only one product division.

DIVR (2)

. Refer to the statement under DIV .

. Collaboration with GWB .

. Techno marketing consultancy arrangement with XLO, India.

KALN (3)

. Capital was allocated for the only product.

(20) TALBROS AUTOMOTIVE COMPONENTS, LTD.

PRST (1)

. Same kind of technology was used across divisions.

MSEL (2)

. The company was selling its products both in the domestic market as well as in the international market.

DMND (1)

. Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 18.15%.
- . No use of foreign brand name.

COMN (1)

- . No information is available.

DIV (3)

- . Gasket Division; Engineering Division; Materials Division.

DIVR (2)

- . Refer to the statement under DIV.
- . "AEW Janson, Ltd. was amalgamated with the company...."
- . "Agreement between the company and Payen International, Ltd. for transfer of technology...."

KALN (3)

- . "In 1980, the company undertook a programme of modernisation of plant and machinery at Gaskets and Hydraulic division..."
- . "Also, another unit...was being set up at Sohna...."
- . "...for the expansion of the engineering division..., the company had purchased identical adjoining factory premises...."

(21) CPEC, LTD.

PRST (1)

- . Same technology was used to produce the products across divisions.

MSEL (1)

- . The company was selling its products only in the domestic market.

DMND (1)

- . Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 26.10%.

. No use of foreign brand name.

COMN (2)

. Common Marketing Department

DIV (3)

. The company had two factories located in Bombay and Maharashtra.

DIVR (2)

. Refer to the statement under DIV.

. "In 1963, the company obtained technical know-how from the Erstwhile crofts (Engineers), Ltd., U.K...."

. "A technical collaboration was also entered into with Renold, Ltd. U.K."

KALN (3)

. "...The company undertook to set up new facilities at Taloja...."

. "In 1983, operations commenced at the new factory at Thane."

. "The objects of the public issue of capital... was to raise a part of the funds required for meeting the capital expenditure for the expansion and diversification at Thane and Taloja...."

(22) ATLAS CYCLE INDUSTRIES, LTD.

PRST (2)

. Somewhat common technology was used across divisions.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs. Crores)
1986-87	83.31	1.65

DMND (2)

. To some extent products were complementary.

MNCS (1)

. Foreign equity holding was 0.62%.

. No use of foreign brand name.

COMN (2)

. Common R and D Department.

DIV (3)

. U.P. Project Unit; Gurgaon Mill Unit; Haryana Factory.

DIVR (2)

. Refer to the statement under DIV.

. Collaboration with National Development Corporation, Tanzania.

. Collaboration with S.A.C.E.M., France.

. New product Atlas Power King was launched into the market.

KALN (3)

. Capital was allocated specifically for the Gurgaon Project and U.P. Project.

(23) DYNAMATIC HYDRAULICS, LTD.

PRST (3)

. Distinct groups are identifiable across divisions.

MSEL (2)

. Products were available in the domestic market.

. The company exported to the U.S., East Europe etc.

DMND (3)

. Independent groups are identifiable.

MNCS (2)

. Foreign equity holding was 9.66%.

. Use of foreign brand name Hydraulic.

COMN (2)

. Common Marketing Department

DIV (3)

. Hydraulic Division; Office systems Division; Power Systems

Division.

DIVR (2)

- . Refer to the statement under DIV.
- . "The company entered into a technical collaboration agreement with Dowty Hydraulic Units, Ltd., Cheltenham, England...."
- . Technical collaboration with Nashua Corporation, Nashua, U.S.A.
- . Expansion of product range into non-mobile markets.

KALN (3)

- . Capital was separately allocated to each product division.

(24) MONOTYPE INDIA, LTD.

PRST (2)

- . Somewhat common technology was used to produce the products across divisions.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs. Crores)
1990-91	6.71	0.028

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

- . Foreign equity holding was 33.02%.
- . Use of foreign brand name MONOTYPE.

COMN (2)

- . Common Marketing Department

DIV (3)

- . The company has two factories located in Bangalore and Calcutta. Each of them was producing separate kinds of goods.

DIVR (2)

- . Collaboration with Monotype, U.K.

DIV (3)

- . Gear Division; Gear Box Division; Engineering Division; Foundry Division.

DIVR (2)

- . Refer to the statement under DIV.
- . "Shanthi Sales Pvt.Ltd., is a wholly owned subsidiary."
- . "In 1986, the company was negotiating collaboration agreement with a few manufacturers abroad (Belgium, U.S.A., and Japan) for the manufacture of helical gear boxes."

KALN (2)

- . "During 1989-90, the company implemented a modernisation/expansion programme at a cost of Rs.323.86 lakhs...."

(26) ALFRED HERBERT (INDIA), LTD.

PRST (3)

- . Rubber and Tyre building machines used a specific kind of technology and other products require different kinds of technology.

MSEL (2)

Year	Turnover (Rs. Crores)	Exports (Rs. Crores)
1982-83	13.10	+ ve
1986-87	09.70	+ ve

- . The company exported to the U.S.A. and Malaysia.

DMND (3)

- . Distinct groups are identifiable.

MNCS (2)

1989-90

642.93

- . The company was selling its products in the domestic market.
- . No information is available on exports.

DMND (1)

- . Products were highly related.

MNCS (1)

- . Foreign equity holding was 13.30%.
- . No use of foreign brand name.

COMN (2)

- . "Orient Engineering and Commercial Co. Ltd., Calcutta were appointed as sole selling agents of the honing machines produced by the Company."

DIV (3)

- . Udyognagar and Bilhaus Factories produced separate kinds of products.
- . "The company undertook to set up a project for the manufacture of precision honing machines at village Maharajpur in Kanpur...."

DIVR (2)

- . Refer to the statements under DIV.
- . Technical collaboration with Gehring, West Germany.

KALN (3)

- . "ICICI,...., sanctioned a term loan of Rs.100 lakhs for the Company's honing machines project."
- . One of the main objects of the public issue of equity shares was to finance partly the honing machines project.

(28) TAPARIA TOOLS, LTD.

PRST (1)

- . Common technology and inputs were used to produce the products.

MSEL (2)

Year	Turnover (Rs. Lakhs)	Exports (Rs. Lakhs)
1990-91	1325.00	144.00

DMND (1)

- . Products were highly complementary to each other.

MNCS (1)

- . Foreign equity holding was 3.29%.
- . No use of foreign brand name.

COMN (1)

- . Refer to the statement under DIV.

DIV (1)

- . No separate product divisions are observable.

DIVR (2)

- . Collaboration with Aktiebolaget Bahco, Sweden.
- . "In 1982-83, the company diversified its activities to manufacture of forgings for the automotive industry."

KALN (2)

- . "The company proposed to install essential capital assets estimated to cost Rs.83 lakhs as a part of modernisation programme."
- . "During 1986-87,... a rehabilitation and modernisation programme was chalked out which envisaged a new investment of about Rs.156 lakhs...."

DATA FOR THE GENERAL ENGINEERING INDUSTRY

SL.NO.	NAME OF THE COMPANY	CVSI	CVVI	DUMY	PRST
1.	MOTOR INDUSTRIES CO.,LTD.	26.2160	11.4385	1	3
2.	KIRLOSKAR CUMMINS,LTD.	33.2993	40.4677	1	3
3.	VOLTAS LTD.	50.7189	39.2893	1	2
4.	INGERSOLL-RAND (INDIA),LTD.	22.9779	06.7294	1	3
5.	EICHER MOTORS,LTD.	81.6803	75.7916	0	2
6.	KSB PUMPS,LTD.	25.5009	06.4909	1	3
7.	ALFA LAVAL (INDIA),LTD.	30.6299	50.5479	1	2
8.	EICHER TRACTORS,LTD.	40.2808	10.9223	1	1
9.	MAHARASHTRA SCOOTERS,LTD.	23.0013	13.9702	1	1
10.	TIL,LTD.	14.9428	20.6025	1	2
11.	FLAKT INDIA,LTD.	18.0258	21.4216	1	1
12.	WORTHINGTON PUMP INDIA,LTD.	11.0338	11.2387	0	1
13.	KUNAL ENGINEERING CO.,LTD.	38.8959	24.0788	1	1
14.	SIPANI AUTOMOBILES,LTD.	16.2899	03.2092	1	1
15.	RANE (MADRAS)LTD.	29.8020	08.6429	1	1
16.	M.POLYGRAPH (INDIA),LTD.	29.9526	50.8549	1	1
17.	S.S.MIRANDA,LTD.	24.7612	21.4641	1	1
18.	REINZ-TALBROS,LTD.	30.6909	14.1533	1	2
19.	XLO-GWB CARDAN SHAFTS,LTD.	35.6306	22.9705	0	1
20.	TALBROS AUTOMOTIVE COM.,LTD.	30.0373	09.6918	1	1
21.	CPEC,LTD.	27.9192	49.2488	1	1
22.	ATLAS CYCLE IND.,LTD.	21.2619	28.2301	1	2
23.	DYNAMIC HYDRAULICS,LTD.	11.9851	08.5464	1	3
24.	MONOTYPE INDIA,LTD.	33.5117	30.0723	1	2
25.	SHANTI GEARS,LTD.	57.4798	16.6935	0	1
26.	ALFRED HERBERT (INDIA),LTD.	13.6847	12.3029	1	3
27.	EMA INDIA,LTD.	40.2407	30.7545	1	1
28.	TAPARIA TOOLS,LTD.	06.1366	04.5466	1	1

CONTD.

DATA FOR THE GENERAL ENGINEERING INDUSTRY

SL.NO.	MSEL	DMND	MNCS	COMN	DIV	DIVR	KALN	WAGE
1.	2	1	2	2	3	3	3	30.44308
2.	2	3	2	2	3	2	3	09.44560
3.	2	2	1	2	3	2	3	11.67470
4.	2	3	2	1	3	3	3	13.06240
5.	2	3	2	1	1	1	3	02.09530
6.	1	3	2	2	3	2	3	25.19480
7.	2	2	2	2	3	2	3	12.07590
8.	1	1	1	2	3	3	3	07.45700
9.	1	1	1	1	1	1	3	02.39460
10.	1	3	1	2	3	2	3	10.07050
11.	2	3	2	2	3	2	3	11.81610
12.	2	2	2	2	3	2	3	27.57830
13.	2	1	1	1	1	2	3	11.33270
14.	2	1	1	1	1	2	3	21.01300
15.	2	1	1	2	3	2	3	17.90890
16.	2	3	1	1	1	2	3	20.04000
17.	2	3	1	2	3	2	3	15.88910
18.	1	2	2	2	3	2	3	12.9086
19.	2	1	2	1	1	2	3	11.0713
20.	2	1	1	1	3	2	3	19.6874
21.	1	1	1	2	3	2	3	53.0756
22.	2	2	1	2	3	2	3	08.2196
23.	2	3	2	2	3	2	3	25.2658
24.	2	3	2	2	3	2	3	25.0081
25.	1	1	1	2	3	2	2	08.9318
26.	2	3	2	1	1	2	2	13.9953
27.	1	1	1	2	3	2	3	17.1851
28.	2	1	1	1	1	2	2	23.6731

CONTD. DATA FOR THE GENERAL ENGINEERING INDUSTRY

SL.NO.	LQID	DEBT	EQTY	ASET	GRTH	VRTI
1.	2.1900	00.5375	00.02	1.4844	0.6883	10.6002
2.	1.4940	01.2268	00.25	1.6477	0.4368	27.0369
3.	1.0160	04.3571	00.36	2.7844	0.4611	22.8042
4.	1.8900	00.9743	00.85	0.7723	0.6963	29.1169
5.	1.3150	09.4304	00.06	0.3471	0.0381	73.1863
6.	1.7020	01.0476	05.36	0.4496	0.7491	25.8454
7.	1.8440	01.0288	00.27	0.5654	0.6371	20.9261
8.	1.3000	03.0440	00.86	0.5146	0.8646	11.7732
9.	1.3800	02.0386	00.14	1.0701	0.2335	04.3650
10.	1.3675	04.1156	04.00	4.9337	0.3007	36.0350
11.	1.1120	03.4949	14.48	0.3345	2.0000	08.0671
12.	0.9550	03.2978	00.00	0.2187	0.4944	38.8042
13.	1.3500	04.8907	19.20	0.2906	0.1432	38.3648
14.	0.8700	15.0713	20.25	0.2556	0.1038	94.5748
15.	1.4280	01.2277	06.75	0.2288	0.6370	20.6437
16.	2.8240	03.0578	38.99	0.1777	0.8360	39.2921
17.	1.5120	01.5218	00.00	0.1628	0.0972	30.7121
18.	1.8780	00.8750	29.37	0.0539	1.2004	17.5353
19.	1.1600	09.2672	00.15	0.1035	0.1474	38.6961
20.	1.4500	01.5017	29.37	0.0969	0.8398	20.7856
21.	0.9000	01.7458	17.21	0.0407	-0.1503	75.7669
22.	1.2480	01.7863	01.69	0.4209	0.5269	12.7938
23.	1.4250	02.3847	09.27	0.0539	0.2217	55.1885
24.	1.3350	01.9593	00.44	0.0457	-0.1846	25.0001
25.	1.3360	01.8184	35.39	0.0554	1.2888	26.1928
26.	1.3167	00.9108	01.10	0.1501	-0.1677	23.2537
27.	1.5480	01.8388	22.90	0.0491	0.8191	22.1291
28.	1.3150	10.9252	04.09	0.0855	0.0654	29.2722

CONTD. DATA FOR THE GENERAL ENGINEERING INDUSTRY

SL.NO.	CAPA	SALE	SHPT	LOPA	LOPT
1.	062.6639	2.3256	07.2199	11.2365	16.8969
2.	044.7952	1.8587	06.0794	06.7680	14.9185
3.	049.3604	3.3181	02.8571	04.2623	22.2969
4.	063.8229	0.9849	09.7212	12.5475	24.6908
5.	077.4500	0.7425	02.9230	08.2906	72.2782
6.	069.6504	0.4618	14.3350	14.9524	25.2631
7.	041.4893	0.7429	07.9006	10.5529	20.8901
8.	079.1883	1.4658	03.9171	11.1082	41.1888
9.	100.0476	0.9109	09.3894	08.0327	28.3759
10.	029.3111	0.4743	01.6951	01.6999	08.5694
11.	048.0897	0.4297	04.0707	05.2185	23.3144
12.	012.7069	0.1339	01.7131	01.1139	04.1009
13.	095.1167	0.2222	04.5529	04.5414	20.6199
14.	017.1000	0.0412	22.0462	03.9004	40.6805
15.	062.9317	0.2858	07.1528	08.9397	19.7614
16.	070.1515	0.1447	05.2312	04.2415	17.6047
17.	064.4518	0.1451	02.8709	02.6905	08.8367
18.	054.3173	0.0586	12.1094	13.4499	25.1175
19.	067.3473	0.0949	00.9594	00.9834	10.5636
20.	056.7975	0.1296	03.4034	04.4239	10.9628
21.	010.3651	0.0161	04.3174	01.3827	03.2953
22.	037.8699	0.8401	01.4027	02.9569	07.9937
23.	055.7002	0.0412	01.4251	01.0916	03.8809
24.	051.4855	0.0537	01.5961	01.8553	05.7749
25.	074.7254	0.0477	09.5460	08.0996	23.5784
26.	090.1579	0.1471	01.7384	01.7051	03.2013
27.	032.5000	0.0423	08.3708	06.3119	17.8995
28.	055.4891	0.1454	03.5023	05.8571	75.9758

Notes :

SL.NO.	NAME OF THE COMPANY	YEARS
5.	EICHER MOTORS,LTD.	1990; 1991
8.	EICHER TRACTORS,LTD.	1987; 1988; 1989; 1991
10.	TIL,LTD.	1986; 1987; 1990; 1991
12.	WORTHINGTON PUMP INDIA,LTD.	1985; 1986; 1987; 1990
13.	KUNAL ENGINEERING CO.,LTD.	1989; 1990; 1991
14.	SIPANI AUTOMOBILES,LTD.	1990; 1991
19.	XLO-GWB CARDAN SHAFTS,LTD.	1986; 1989; 1990
21.	CPEC,LTD.	1985; 1986; 1990
23.	DYNAMATIC HYDRAULICS,LTD.	1988; 1990
24.	MONOTYPE INDIA,LTD.	1986; 1988; 1989; 1990
26.	ALFRED HERBERT (INDIA),LTD.	1985; 1986; 1990
28.	TAPARIA TOOLS,LTD.	1990; 1991